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U. S. DEPARTMENT OF THE INTERIOR
PROTOTYPE OIL SHALE LEASING PROGRAM

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OIL SHALE TRACT C-b

INTERIM MONITORING REPORT SUPPLEMENT

(November 1976 Through August 1977)

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Submitted to:

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By:

C-b Shale Oil Venture

Occidental Oil Shale, Inc., Operator

Ashland Colorado

December 16, 1977

INTRODUCTION

The Environmental Baseline Period for Oil Tract C-b covered the period from November 1, 1974 to October 31, 1976. Results have been reported in 9 Quarterly Data Reports, 8 Quarterly Summary Reports, Annual Summary and Trends Report and a 5-volume Final Baseline Report, all submitted to the Area Oil Shale Supervisor.

From November 1, 1976 through August 31, 1977 the C-b Tract has been under a period of suspension of the Federal Oil Shale Lease. The results from this period, known as the Interim Monitoring Phase, were reported in a data report submitted to the Area Oil Shale Supervisor on October 14, 1977. This report is a supplement to the Interim Monitoring Report and includes additional data and corrections not found in the previous report, due to data lag.

For consistency with all previous quarterly reports an identical outline and tabbing have been followed in this report. Tabs are subdivided as required for corrections or additions to the Interim Monitoring Report or the Final Environmental Baseline Report. All corrections will bear the same table and page numbers that were assigned to them in the text in which they previously appeared.

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II B-1 Air Quality and Surface Meteorology

Air Quality Station 023, the precipitation gauges at Stations 020 and 023 and the MRI Mechanical Weather Station were utilized to provide air quality and surface meteorological data. References 1-10 containing basic data are included at the end of the air quality section.

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QUARTERLY SUMMARY (MARCH 1977 - MAY 1977)
($\mu\text{g}/\text{m}^3$)
STATION 023

Parameter	Average	Maximum 24 Hour Value Time	Maximum 8 Hour Value Time	Maximum 3 Hour Value Time	Maximum 1 Hour Value Time	Maximum 5 Minutes Value Time
SO ₂	0.1	2.3 5/16/77 13:00		4.7 5/16/77 18:55	11.5 3/8/77 8:30	104.2 3/18/77 15:35
H ₂ S	0.3				8.4 4/20/77 12:30-13:30	27.7 3/28/77 10:55
Particulate	9.2 *	67. 5/17/77				
TIC	1135.			1463.1 4/19/77 6:00-9:00		3198.8 5/26/77 6:30
Cl ₄	874.			1075.3 4/10/77 6:00-9:00		2539.8 4/14/77 15:40
NOIC	261.			554.2 4/19/77 6:00-9:00		2246.1 5/23/77 11:55
O ₃	84.9				127.6 5/17/77 14:45-15:45	265.7 3/28/77 15:15
NO _x	1.0				20.4 4/18/77 6:40-7:40	91.7 4/2/77 23:05
NO	0.5				14.7 4/25/77 11:50-12:50	52.4 5/13/77 8:40
CO	404. (1)		816.8 4/19/77 20:55-4:55		1530.8 4/20/77 3:05-4:05	4469.7 5/18/77 12:20
NO ₂	0.4				17.5 4/21/77 2:30-3:30	74.9 4/1/77 6:00

*Geometric

(1) Data missing for April.

TABLE II B-4a

QUARTERLY SUMMARY (JUNE 1977 - AUGUST 1977)
($\mu\text{g}/\text{m}^3$)
STATION 023

Parameter	Average	Maximum 24 Hour Value Time	Maximum 8 Hour Value Time	Maximum 3 Hour Value Time	Maximum 1 Hour Value Time	Maximum 5 Minutes Value Time
SO ₂	0.7	0.4 8/19/77 13:00		2.1 8/24/77 10:55	3.0 8/24/77 11:50	23.4 6/27/77 8:35
H ₂ S (1)						
Particulate	10.6*	74. 8/12/77				
TIC	1133.			1280.3 7/29/77 6:00-9:00		3241.8 7/19/77 6:55
Cl ₄	855.			995.9 7/15/77 6:00-9:00		2464.3 7/16/77 6:40
MHC	278.			441.2 7/29/77 6:00-9:00		2309.9 7/19/77 6:55
O ₃	92.1				164.1 8/24/77 10:25	885.0 7/31/77 8:25
NO _x	0.8				30.1 6/28/77 15:20	104.8 7/9/77 5:10
NO	0.5				11.5 6/24/77 12:50	37.4 6/24/77 13:50
CO	260.				848.9 8/4/77 00:25	5694.8 6/10/77 2:40
NO ₂	0.3		747.4 8/3/77 17:55-1:55		30.1 6/28/77 15:20	104.8 7/9/77 5:10

* Geometric

(1) Side-by-side testing was initiated for SO₂ at Station 023 as a data reliability check for five months beginning 1 April, 1977. Therefore, no H₂S data were taken at 023 for this time period.

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Table II B-5

MAXIMUM CONCENTRATIONS OF SO₂ (μg/m³)

NOVEMBER 1976 - AUGUST 1977

STATION 023

ITEM	MONTH											
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	(2)	(2)
1-Hour Maximum												
Value (μg/m ³)	16.5	7.8	21.1	11.7	11.5	3.0	5.2	}	2.0	3.0		
Date	11/23/76	12/9/76	1/20/77	2/4/77	3/8/77	4/24/77	5/16/77		7/29/77	8/24/77		
Time (MST)	0945-1045	1040-1140	1505-1605	0055-0155	0830-0930	1145-1545	1840-1940		0950-1050	1150-1250		
Wind Direction (Deg.)	4	205	197	249	191	23	202		(1)			
Wind Speed (mph)	2	15	7	1	19	10	26			14		
3-Hour Maximum												
Value (μg/m ³)	15.9	2.8	17.6	9.4	4.5	2.3	4.7	}	0.9	2.1		
Date	11/23/76	12/9/76	1/21/77	2/3/77	3/8/77	4/24/77	5/16/77		7/10/77	8/24/77		
Time (MST)	0930-1230	0840-1140	0430-0730	1950-2250	0815-1115	1245-1545	1855-2155		0410-0710	1055-1355		
Wind Direction (Deg.)	37	194	131	182	194	2	236		207	214		
Wind Speed (mph)	3	15	2	2	20	10	17		11	13		
24-Hour Maximum												
Value (μg/m ³)	15.5	1.4	11.5	5.9	1.7	1.2	2.3	}	0.3	0.4		
Date	11/23/76	12/2-3/76	1/25-26/77	2/3-4/77	3/5-6/77	4/24-25/77	5/16-17/77		7/10-11/77	8/19-20/77		
Time (MST)	1000	1200	0500	1400	1400	0400	1300		0000	1300		
Wind Direction (Deg.)	158	132	148	268	170	319	220		214	305		
Wind Speed (mph)	2	5	5	3	4	5	16		6	1		

* Missing Data

(1) No Data. (Lightning strike)

(2) Data prior to April utilize the Meloy SA185-2 analyzer. On April 1 and thereafter this instrument was replaced by the more accurate SA185-2A analyzer.

Table II B-6

MAXIMUM CONCENTRATIONS OF SO₂ - SECOND INSTRUMENT
($\mu\text{g}/\text{m}^3$)
NOVEMBER 1976 - AUGUST 1977

ITEM	MONTH									
	NOV	DEC	JAN	FEB	MAR	APR (2)	MAY (2)	JUNE (2)	JULY (2)	AUG
1-hour Maximum Value ($\mu\text{g}/\text{m}^3$) Date Time (MST) Wind Direction (Deg.) Wind Speed (mph)						8.4 4/20/77 1230-1330 350 10	8.1 5/16/77 1535-1635 189 27	33.0 6/23/77 0805-0905 312 3	17.4 7/31/77 0835-0935 } (1)	

(1) No Data. (Lightning strike)

(2) Side-by-side monitoring of SO₂ at Station 023 was initiated as a data reliability check for four months beginning 1 April, 1977. This instrument is the Meloy SA185-2.

Table II B-7

MAXIMUM CONCENTRATIONS OF H_2S ($\mu\text{g}/\text{m}^3$)

NOVEMBER 1976 - AUGUST 1977

STATION 023

ITEM	MONTH									
	NOV	DEC	JAN	FEB	MAR	APR (1)	MAY (1)	JUNE (1)	JULY (1)	AUG
1-Hour Maximum										
Value ($\mu\text{g}/\text{m}^3$)	19.8	11.2	5.5	3.6	7.1					20.6
Date	11/22/76	12/30/76	1/2/77	2/3/77	3/31/77					8/25/77
Time (MST)	1340-1440	0245-0345	0155-0255	1235-1335	0320-0420					1105-1205
Wind Direction (Deg.)	319	119	201	12	36					215
Wind Speed (mph)	5	4	13	4	1					12

(1) Side-by-side monitoring of SO_2 at Station 023 was initiated as a data reliability check for four months beginning 1 April, 1977. Therefore, no H_2S data were taken at 023 for this time period.

Table II B-8

MAXIMUM CONCENTRATIONS OF PARTICULATES ($\mu\text{g}/\text{m}^3$)

NOVEMBER 1976 - AUGUST 1977

STATION 023

ITEM	MONTH										
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	
24-hour Maximum Value ($\mu\text{g}/\text{m}^3$) Date	21 11/7/76	17 12/14/76	22 1/22/77	23 2/21/77	28 3/13/77	36 4/27/77	67 5/17/77	28 6/2/77	33 7/1/77	74 8/12/77	

Table II B-9
MAXIMUM CONCENTRATIONS OF THC ($\mu\text{g}/\text{m}^3$)

NOVEMBER 1976 - AUGUST 1977

STATION 023

ITEM	MONTH									
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG
3-hour Maximum Value ($\mu\text{g}/\text{m}^3$)	1999.0	1187.0	1555.0	1165.0	1172.0	1463.0	1364.0	1243.0	1280.3	1210.5
Date	11/28/76	12/21/76	1/7/77	2/20/77	3/31/77	4/19/77	5/23/77	6/2/77	7/29/77	8/20/77
Time (MST) (6-9 A.M.)										
Wind Direction (Deg.)	146	112	139	171	150	299	156	145	(1)	23
Wind Speed (mph)	1	4	5	2	3	6	13	5		2

(1) No data. (Lightning strike)

Table II B-10

MAXIMUM CONCENTRATIONS OF NMIC ($\mu\text{g}/\text{m}^3$)

NOVEMBER 1976 - AUGUST 1977

STATION 023

ITEM	MONTH										
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	
3-hour Maximum											
Value ($\mu\text{g}/\text{m}^3$)	1025.7	272.9	621.3	470.0	405.3	554.2	475.6	356.3	441.2	413.2	
Date	11/28/76	12/21/76	1/7/77	2/28/77	3/1/77	4/19/77	5/23/77	6/29/77	7/29/77	8/20/77	
Time (MST) (6-9 A.M.)	-	-	-	-	-	-	-	-	-	-	
Wind Direction (Deg.)	146	112	139	190	141	299	156	97	} (1)	23	
Wind Speed (mph)	1	4	5	5	8	6	13	2		2	

(1) No Data. (Lightning strike)

Table II B-11

MAXIMUM CONCENTRATIONS OF CH_4 ($\mu\text{g}/\text{m}^3$)

NOVEMBER 1976 - AUGUST 1977

STATION 023

ITEM	MONTH										
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	
3-Hour Maximum											
Value ($\mu\text{g}/\text{m}^3$)	1029.8	1159.2	959.8	893.9	872.2	1075.3	981.7	927.6	995.9	881.2	
Date	11/16/76	12/10/76	1/9/77	2/10/77	3/31/77	4/16/77	5/20/77	6/17/77	7/15/77	8/11/77	
Time (AST) (6-9 A.M.)	-	-	-	-	-	-	-	-	-	-	
Wind Direction (Deg.)	298	259	176	217	150	352	295	62	168	(1)	
Wind Speed (mph)	2	3	0	1	3	2	2	2	5	4	

(1) No Data. (Lightning strike)

Table II B-12

MAXIMUM CONCENTRATIONS OF CO ($\mu\text{g}/\text{m}^3$)

NOVEMBER 1976 - AUGUST 1977

STATION 023

ITEM	MONTH											
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG		
1-Hour Maximum												
Value ($\mu\text{g}/\text{m}^3$)	896.0	1215.4	716.4	819.7	932.8	1530.8	1075.2	714.3	741.2	948.9		
Date	11/18/76	12/8/76	1/13/77	2/5/77	3/22/77	4/20/77	5/16/77	6/10/77	7/14/77	8/4/77		
Time (MST)	0130-0230	0540-0640	1540-1640	1115-1215	1040-1140	0305-0405	1055-1155	0005-0105	0235-0335	0025-0125		
Wind Direction (Deg.)	140	65	124	203	357	235	179	170	158	(1)		
Wind Speed (mph)	0	1	2	7	2	2	28	3	9	(1)		
8-Hour Maximum												
Value ($\mu\text{g}/\text{m}^3$)	814.1	1005.4	584.7	569.6	581.9	816.8	793.5	383.5	573.0	747.4		
Date	11/23/76	12/6/76	1/27/77	2/19/77	3/22/77	4/19/77	5/13/77	6/9/77	7/16/77	8/3/77		
Time (MST)	2355-0755	2155-0555	0655-1455	0555-1355	0955-1755	2055-0455	0955-1755	2255-0655	1255-2055	1755-0155		
Wind Direction (Deg.)	146	152	192	360	158	162	309	170	101	(1)		
Wind Speed (mph)	3	7	5	4	3	1	8	3	4	(1)		

(1) No data. (Lightning strike)

Table II B-13
MAXIMUM CONCENTRATIONS OF NO ($\mu\text{g}/\text{m}^3$)

NOVEMBER 1976 - AUGUST 1977

STATION 023

ITEM	MONTH										
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	
1-Hour Maximum											
Value ($\mu\text{g}/\text{m}^3$)	54.8	202.2	10.9	0.9	3.6	14.7	5.6	11.5	1.6	7.0	
Date	11/2/76	12/29/76	1/8/77	2/11/77	3/14/77	4/25/77	5/20/77	6/24/77	7/10/77	8/31/77	
Time (MST)	0800-0900	0600-0700	2135-2235	0715-0815	0300-0400	1150-1250	0010-0110	1250-1350	0855-0955	1030-1130	
Wind Direction (Deg.)	94	129	291	176	238	349	167	8	213	2	
Wind Speed (mph)	1	3	6	2	3	9	3	11	17	5	

Table II B-14

MAXIMUM CONCENTRATIONS OF NO₂ (µg/m³)

NOVEMBER 1976 - AUGUST 1977

STATION 023

ITEM	MONTH										
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	
1-Hour Maximum											
Value (µg/m ³)	95.2	84.6	24.7	1.9	3.7	17.5	7.3	30.1	25.7	13.7	
Date	11/28/76	12/1/76	1/7/77	2/11/77	3/21/77	4/21/77	5/19/77	6/28/77	7/9/77	8/9/77	
Time (MST)	0240-0340	1020-1120	0255-0355	1210-1310	1000-1100	0230-0330	1740-1840	1520-1620	0445-0545	0825-0925	
Wind Direction (Deg.)	174	116	130	341	8	172	332	301	83	(1)	
Wind Speed (mph)	0	2	4	12	3	0	8	12	5	3	

(1) No Data. (Lightning strike)

Table II B-15

MAXIMUM CONCENTRATIONS OF OZONE: ($\mu\text{g}/\text{m}^3$)

NOVEMBER 1976 - AUGUST 1977

STATION 023

ITEM	MONTH									
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG
1-Hour Maximum										
Value ($\mu\text{g}/\text{m}^3$)	115.1	97	88.7	95.7	105.5	118.5	127.6	147.5	147.8	164.1
Date	11/20/76	12/1/76	1/12/77	2/26/77	3/24/77	4/18/77	5/17/77	6/18/77	7/23/77	8/24/77
Time (NST)	1100-1200	0015-0115	2155-2255	1855-1955	1520-1620	1540-1640	1445-1545	1450-1550	1345-1445	1025-1125
Wind Direction (Deg.)	343	358	139	268	193	237	204	219	(1)	(1)
Wind Speed (mph)	5	10	3	6	18	15	20	18	(1)	(1)

(1) No data. (Lightning strike)

MONTHLY AND TEN-MONTH AVERAGE AMBIENT AIR CONSTITUENT CONCENTRATIONS
OF GASES AND PARTICULATES ($\mu\text{g}/\text{m}^3$)

STATION 023
1976 - 1977

CONSTITUENT	MONTH										Ten Month Average (Arithmetic)
	NOV	DEC	JAN	FEB	MAR	APR ²	MAY ²	JUNE ²	JULY ²	AUG	
NO ($\mu\text{g}/\text{m}^3$)	2.2	1.1	0.3	0.0	0.2	1.3	0.1	0.2	0.1	1.1	0.66
NO ₂ ($\mu\text{g}/\text{m}^3$)	4.8	1.7	0.5	0.1	0.2	1.1	0.0	0.3	0.6	0.1	0.94
O ₃ ($\mu\text{g}/\text{m}^3$)	79.5	66.7	70.3	74.3	78.9	80.6	95.3	91.5	89.0	95.8	82.19
Non-Methane H.C. ($\mu\text{g}/\text{m}^3$)	185.6	118.8	196.5	254.3	305.6	292.3	184.1	248.7	312.9	272.5	237.13
CH ₄ ($\mu\text{g}/\text{m}^3$)	948.3	979.3	872.3	745.8	789.4	911.0	921.3	890.5	853.8	822.0	873.37
CO ($\mu\text{g}/\text{m}^3$)	354.9	431.8	326.5	312.0	370.9	*	437.8	275.1	266.2	239.3	334.94
SO ₂ ($\mu\text{g}/\text{m}^3$) ⁴	1.4	0.1	1.7	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.41
H ₂ S ($\mu\text{g}/\text{m}^3$)	0.6	0.5	0.4	0.1	0.3					1.2	0.52 ³
Particulate ($\mu\text{g}/\text{m}^3$)	7.3	4.1	3.3	6.7	6.3	6.4	18.2	14.9	11.5	8.5	8.72

* Missing Data

¹ 50% or Less Data

² Side-by-side testing was initiated for SO₂ at Station 023 as a data reliability check for four months beginning 1 April, 1977. Therefore, no H₂S data were taken at 023 for this time period.

³ Six Month Average

⁴ SO₂ data prior to April utilize the Meloy SA185-2 analyzer. On April 1 and thereafter, this instrument was replaced by the more accurate SA185-2A analyzer.

Table II B-17

METEOROLOGICAL SUMMARY: VECTOR MONTHLY AVERAGES FOR WINDS 1976-1977

(30' Level)

STATION 023

ITEM	MONTH									
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG
Wind Speed (mph)	1.2	2.3	3.2	1.9	3.9	2.0	6.9	4.0	5.5	2.6
Wind Direction (Deg)	237.4	200.4	189.6	251.3	217.3	231.7	200.8	213.1	205.9	222.0

Table II B-18

METEOROLOGICAL SUMMARY: WIND SPEED & DIRECTION
 Station 023
 (30 Foot Height)

Item	Month										Average
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	
Tower 200'											
Wind Speed, 5-Min. Max. (MPH) ⊗	28.0	40.0	33.0	38.0	39.0	33.0	48.0	36.0	44.0	33.0	
Associated Direction (Deg.)	38.5*	69.0	183.0	199.0	346.0	234.0	196.0	208.0	221.0	224.0	
Wind Speed, Hourly Max.(MPH) ⊗	17.0	24.0	19.0	24.0	25.0	22.0	33.0	20.0	24.0	20.0	
Associated Direction (Deg.)	221.0	176.0	87.0*	190.0	78.7*	195.0	190.0	238.5*	182.0	217.5*	
Wind Speed, Hourly Avg.(MPH) ⊗	4.0	5.0	5.0	5.0	8.0	6.0	10.0	8.0	9.0	7.0	6.7
Wind Direction Hourly Avg. (Deg.)	205.0	187.0	175.0	229.0	210.0	220.0	200.0	203.0	200.0	205.0	203.0

*Maximum wind speed was reached > 1 time. Associated Direction was computed as vector mean.

Table II B-19

METEOROLOGICAL SUMMARY: WIND SPEED AND WIND DIRECTION*
1976 - 1977

MRI STATION 044

ITEM	MONTHS											
	1976						1977					
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG		
Wind Speed Hourly Max. (MPH)	21	39	28	28	38	26	29	28	28	28		
Wind Direction (Deg.) Associated w/ Max. Reading	24	1	182	187	289	336	205	96	184	204		
Wind Speed Hourly Avg. (MPH)	5	6	6	6	10	7	11	8	8	7		
Wind Direction Hourly Avg. (Deg.)	183	152	172	112	213	125	184	172	183	178		

*Speed @ 30' level; direction @ 7' level

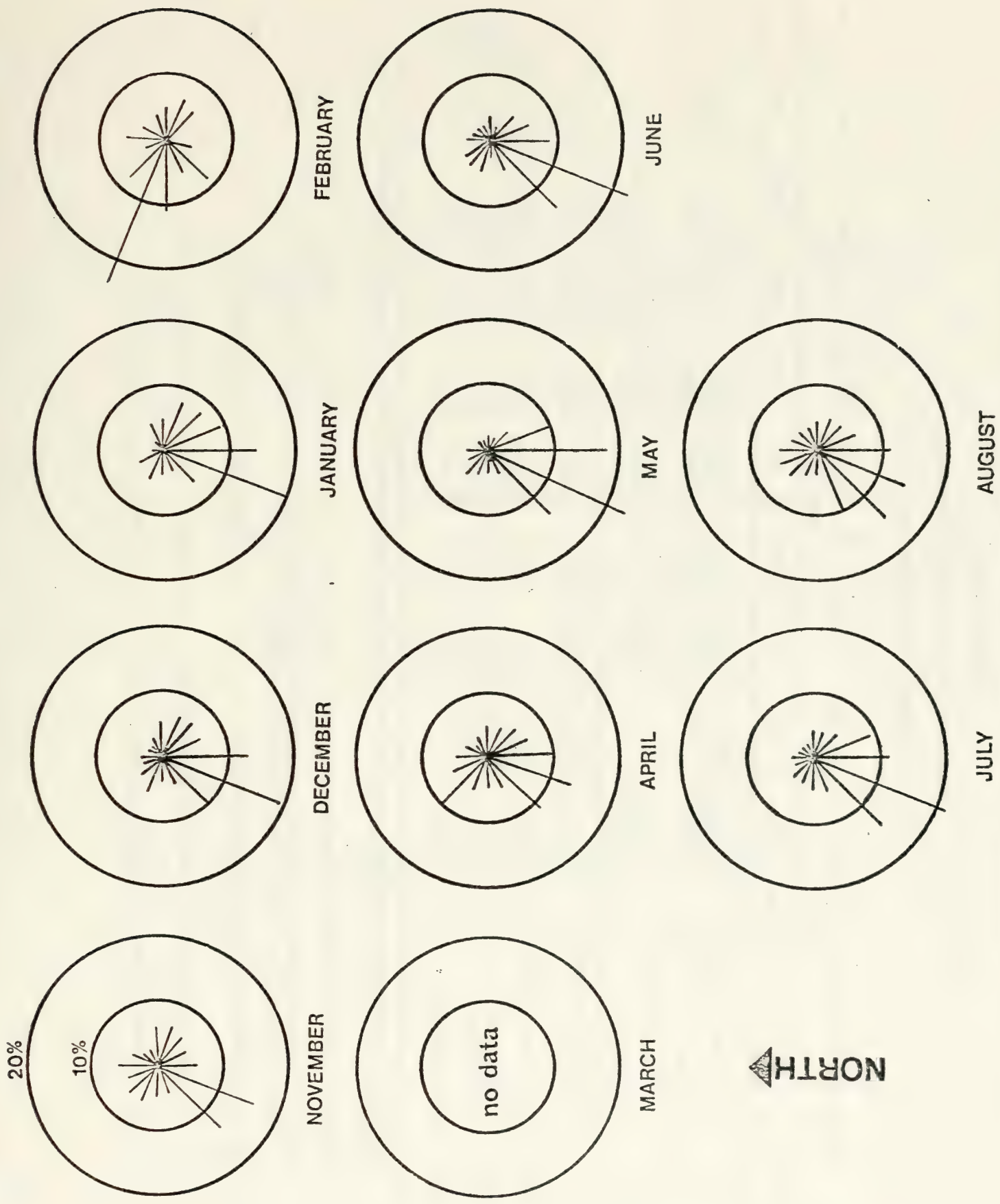


Figure II B-2 STATION 023 30' ELEVATION WIND ROSES (76'-77')

Table II B-20

SUMMARY OF PRECIPITATION AT TWO STATIONS*

(Measured with weighing rain gage)

STATION	ITEM	MONTH											TOTAL
		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG		
020	1-hour Max. (Inches) Date Time (NST)		.02 12/25/76 13:00	.03 } (2)	.05 2/22/77 02:00	.15 3/1/77 12:00	.13 4/27/77 21:00	.14 5/15/77 19:00	.11 6/12/77 12:00	.44 7/19/77 04:00	.22 8/25/77 02:00		
023	1-hour Max. (Inches) Date Time (NST)		.03 12/10/77 02:00	.05 } (3)	.07 2/26/77 19:00	.10 } (4)	.10 4/11/77 10:00	.16 5/15/77 16:00	.02 6/24/77 17:00	.43 7/19/77 15:00	.38 8/5/77 19:00		
020	24-hour Max. (Inches) Date		.04 12/19/77	.22 1/22/77	.17 2/22/77	.38 3/1/77	.27 4/12/77	.30 5/14/77	.11 6/12/77	.69 7/19/77	.73 8/26/77		
023	24-hour Max. (Inches) Date		.04 (1)	.14 1/5/77	.14 2/26/77	.26 3/1/77	.29 4/15/77	.28 5/14/77	.02 (5)	.55 7/19/77	.44 8/5/77		
020	Total (Inches)		.29	.91	.47	1.67	1.24	.94	.15	1.54	2.04	9.25	
023	Total (Inches)		.39	.80	.53	1.58	1.25	1.10	.16	1.85	2.23	9.89	

*Monitoring of precipitation with weighing rain gage was not initiated until December 13, 1976 at Station 020 and December 6, 1976 at Station 023.

(1) The 24-hour max for December at Station 023 occurred 4 times: 12-9-77, 12-10-77, 12-19-77, and 12-31-77.

(2) The 1-hour max for January at Station 020 occurred 6 times: 1-3-77 @ 19:00, 1-3-77 @ 20:00, 1-4-77 @ 18:00, 1-16-77 @ 14:00, 1-22-77 @ 24:00, and 1-23-77 @ 01:00.

(3) The 1-hour max for January at Station 023 occurred 3 times: 1-3--7 @ 18:00, 1-3-77 @ 20:00, and 1-16-77 @ 16:00.

(4) The 1-hour max for March at Station 023 occurred 4 times: 3-1-77 @ 23:00, 3-1-77 @ 24:00, 3-2-77 @ 01:00, and 3-26-77 @ 03:00.

(5) The 24-hour max for June at Station 023 occurred 4 times: 6-8-77, 6-10-77, 6-24-77, and 6-27-77.

Table II B-21
SOLAR RADIATION
STATION 023

Month	Total Langleys	Daily Ave. (Langleys)	Highest Daily Total/Date	Lowest Daily Total/Date
11/26	6725	224.2	307/1	75/13
12/76	5685	183.4	242/1	73/5
1/77	6043	194.9	376/25	54/5
2/77	7850	280.4	409/27	92/22
3/77	10737	346.4	523/27	110/17
4/77	12870	429.0	598/10&24	90/19
5/77	16228	523.5	714/30&31	209/14
6/77	18590	619.7	744/19	381/7
7/77	14526	518.8	731/10	180/22
8/77	13970	450.6	674/1	172/17

The above values have not been modified to include radiation received during downtime (instrument calibration, computer downtime, etc.).

Table II B-22

METEOROLOGICAL SUMMARY: TEMPERATURE AND RELATIVE HUMIDITY
 Station 023
 (30 Foot Height)

Item	Month										Average
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	
Temperature, Hourly Maximum (°F)	59	46	44	53	53	67	71 ⁽¹⁾	82 ⁽¹⁾	83 ⁽¹⁾	85	
Temperature, Hourly Minimum (°F)	-3	8	-4	8	4	12	28 ⁽¹⁾	45 ⁽¹⁾	51 ⁽¹⁾	38	
Temperature, Hourly Average (°F)	34	26	23	29	28	43	49 ⁽¹⁾	68 ⁽¹⁾	70 ⁽¹⁾	66	43.6
Rel. Hum., Hourly Max. (%)	97	96 ⁽¹⁾	(2)	(2)	74 ⁽¹⁾	100	(2)	(2)	(2)	(2)	
Rel. Hum., Hourly Min. (%)	32	30 ⁽¹⁾	(2)	(2)	41 ⁽¹⁾	37	(2)	(2)	(2)	(2)	
Rel. Hum., Hourly Avg. (%)	56	58 ⁽¹⁾	(2)	(2)	56 ⁽¹⁾	67	(2)	(2)	(2)	(2)	59.3

(1) Partial Data Only

(2) Missing Data

CORRECTIONS TO INTERIM MONITORING REPORT

VOLUME II

II B-2 Low Altitude Meteorology

<u>Table/Figure No.</u>	<u>Description</u>	<u>Page</u>
	Text	II B-89
Figure II B-3	Quarterly and Annual Wind Roses for the Meteorological Tower 100' Elevation	II B-90
	Gust Analysis No. of 5-Minute Samples	
Table II B-82	a. 30' Level	II B-91
Table II B-82	b. 100' Level	II B-92
Table II B-82	c. 200' Level	II B-93
Table II B-83	Average Hourly Stability Classes for the Meteorological Tower and Pyranometer	II B-94
Table II B-84	Meteorological Summary: Stability Class Frequencies (%)	II B-95
	Wind Persistence at Specified Stability	
Table II B-126a -126f	Monthly Values for Each Stability Class August 1977	II B-138a to 138f
Table II B-127 -132	Ten Month Summary, November 76 - August 77	II B-139 to 144
Table II B-133 -138	Cumulative Summary Since November 1974	II B-145 to 150

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II B-2 Low Altitude Meteorology

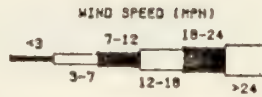
Low altitude meteorological tower data are obtained at 8', 30', 100', and 200' for wind direction and speed, relative humidity, and temperature. Barometric pressure and daytime solar radiation are obtained at ground level. Temperature differences are obtained between the 30' and 100' levels and between the 30' and 200' levels.

Basic low altitude meteorological data through August 1977 are contained in Refs. 1-10 at the end of this section.

<u>Table/Figure No.</u>	<u>Description</u>	<u>Page</u>
Figure II B-3	<u>Wind Rose Diagram</u> This figure presents the wind roses for the 100' level of the meteorological tower for the quarter.	II B-90
Table II B-82	<u>Gust Analyses</u> Cumulative number of 5-minute samples from November 1, 1974 thru August 1977. a. 30 ft. b. 100 ft. c. 200 ft.	II B-91 II B-92 II B-93
Table II B-83	<u>Atmospheric Stability</u> This table presents Pasquill-Gifford average hourly atmospheric stability class for each month. Ranges of dT/dz (variation of temperature with height) corresponding to each class are defined on the table. The sources are the temperature difference from 200' to 30' on the meteorological tower, designated DT2 corrected for wind speed (30') and the pyranometer.	II B-94
Table II B-84	This table shows the stability class frequency distribution for each month.	II B-95

QUARTERLY WIND ROSE - 100' LEVEL
SEPT. '76 - NOV. '76

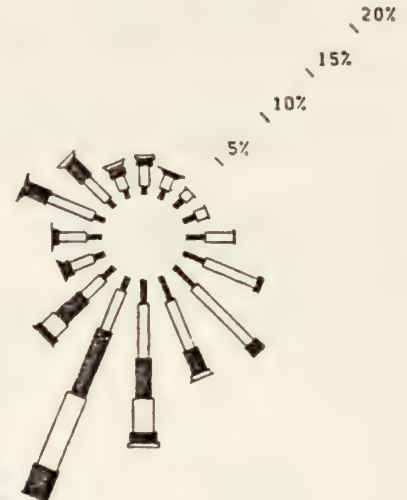
Total % of Calms Distributed (3.26%)
Total No. of 5-Min. Samples - 21165



NORTH

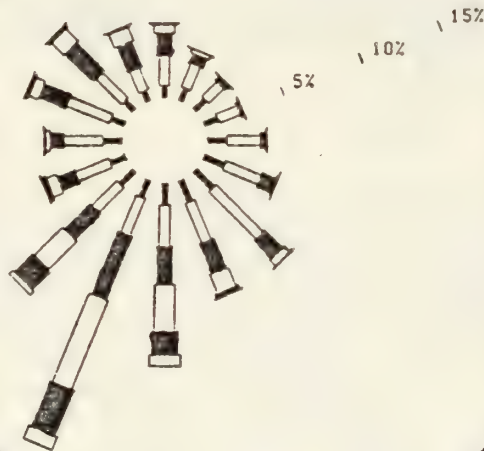
QUARTERLY WIND ROSE - 100' LEVEL
DEC. '76 - FEB. '77

Total % of Calms Distributed (2.94%)
Total No. of 5-Min. Samples - 15629



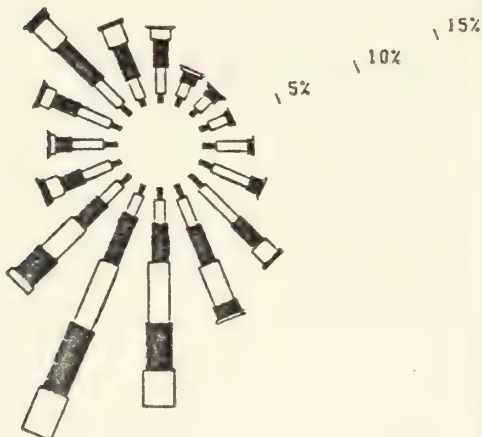
ANNUAL WIND ROSE - 100' LEVEL
SEPT '76 - AUGUST '77

Total % of Calms Distributed (2.11%)
Total No. of 5-Min. Samples - 66955



QUARTERLY WIND ROSE - 100' LEVEL
APRIL '77 - MAY '77

Total % of Calms Distributed (1.08%)
Total No. of 5-Min. Samples - 15080



QUARTERLY WIND ROSE - 100' LEVEL
JUNE '77 - AUGUST '77

Total % of Calms Distributed (0.66%)
Total No. of 5-Min. Samples - 15081

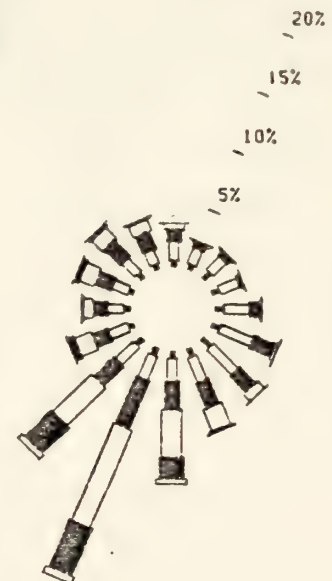


Figure II B-3
METEOROLOGICAL TOWER 100' ELEVATION
QUARTERLY AND ANNUAL WIND ROSES
1976-1977

GUST ANALYSIS - NO. OF 5-MIN. SAMPLES

a. 30 Ft. Level

WIND SPEED RANGE (MPH) (WS_1 - WS_2)

Month	36-40	41-45	46-50	51-55	56-60	61-65	Tot. No. of 5-Min. Samples
Nov. '74							*
Dec. '74		1					*
Jan. '75	1						6712
Feb. '75							6368
Mar. '75	1	1					5628
Apr. '75			1				7884
May '75	1	1					8034
June '75		1					6896
July '75							7682
Aug. '75							7715
Sept. '75							7270
Oct. '75	2						8143
Nov. '75	2						7894
Dec. '75							7681
Jan. '76							7884
Feb. '76	1	1					7757
Mar. '76	1						7778
Apr. '76							6574
May '76							7059
June '76							7760
July '76							*
Aug. '76	1						7636
Sept. '76							7378
Oct. '76							7369
Nov. '76							7160
Dec. '76							7660
Jan. '77							7620
Feb. '77							610
Mar. '77							*
Apr. '77							6945
May '77	2						8226
June '77							8131
July '77							4994
Aug. '77							4767
TOTAL	12	5	1	0	0	0	195,650
Expectation	0.6133×10^{-4}	0.2556×10^{-4}	0.0511×10^{-4}	0.0	0.0	0.0	
P (exceeding WS_2)	0.3067×10^{-4}	0.0511×10^{-4}	0.0	0.0	0.0	0.0	

* Missing Data

Table II B-82

GUST ANALYSIS - NO. OF 5-MIN. SAMPLES

b. 100 Ft. Level

WIND SPEED RANGE (MPH) (WS_1 - WS_2)

Month	36-40	41-45	46-50	51-55	56-60	61-65	Tot. No. of 5-Min. Samples
Nov. '74							8291
Dec. '74	1		1				4826
Jan. '75	1	1					7013
Feb. '75							6345
Mar. '75	1		1				5641
Apr. '75	2			1			7882
May '75		1	1				7977
June '75	1		1				6840
July '75	1	1					7665
Aug. '75	2						7678
Sept. '75							7175
Oct. '75	4	2					7947
Nov. '75	1	2					7788
Dec. '75							7544
Jan. '76							7422
Feb. '76	2	1		1			7655
Mar. '76	3	1					7797
Apr. '76	3						6548
May '76	1						6983
June '76	4						7759
July '76							*
Aug. '76	1	2					7604
Sept. '76							7187
Oct. '76	1						7140
Nov. '76							6838
Dec. '76							7486
Jan. '77							7533
Feb. '77							610
Mar. '77	1						*
Apr. '77							6887
May '77	1	2					8193
June '77							8083
July '77		1					4987
Aug. '77							2011
TOTAL	31	14	4	2	0	0	219,335
Expectation	1.4134×10^{-4}	0.6383×10^{-4}	0.1824×10^{-4}	0.0932×10^{-4}	0.0	0.0	
P (exceeding WS_2)	0.9119×10^{-4}	0.2736×10^{-4}	0.0912×10^{-4}	0.0	0.0	0.0	

* Missing Data

GUST ANALYSIS - NO. OF 5-MIN. SAMPLES

c. 200 Ft. Level

WIND SPEED RANGE (MPH) (WS_1 - WS_2)

Month	36-40	41-45	46-50	51-55	56-60	61-65	Tot. No. of 5-Min. Samples
Nov. '74	1						8239
Dec. '74		1		1			5088
Jan. '75	2	1	1				7036
Feb. '75	2						6338
Mar. '75	1	1		1			5321
Apr. '75	2				1		7452
May '75	1		1	1			8102
June '75	3			1			6848
July '75	4	1					7619
Aug. '75	1	1					7694
Sept. '75	1						7203
Oct. '75	2	4	1				7932
Nov. '75	1	2					7791
Dec. '75	2						7191
Jan. '76							4376
Feb. '76	3	1	1		1		7811
Mar. '76	4	2					7754
Apr. '76	3	1					6729
May '76	1						6920
June '76	2	3					7773
July '76							*
Aug. '76	2	1		1			7549
Sept. '76	1						7129
Oct. '76	1						7113
Nov. '76							6558
Dec. '76	1						7203
Jan. '77							7385
Feb. '77	1						596
Mar. '77	4						8686
Apr. '77							6788
May '77	2	1	2				8131
June '77	1						8026
July '77	1	1					4954
Aug. '77							4946
TOTAL	50	21	6	5	2	0	226,281
Expectation	2.2096×10^{-4}	0.9281×10^{-4}	0.2652×10^{-4}	0.2210×10^{-4}	0.0884×10^{-4}	0.0	
P (exceeding WS_2)	1.5027×10^{-4}	0.5746×10^{-4}	0.3094×10^{-4}	0.0884×10^{-4}	0.0	0.0	

* Missing Data

Table II B-83

AVERAGE HOURLY STABILITY CLASSES

SOURCE: Temperature Differences Between 200 ft. and 30 ft. on the Met Tower (Adjusted for Wind Speed)

MONTH	HOUR																								AVERAGE
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Nov. 76	E	D	D	E	D	E	E	E	D	A	A	B	B	B	B	B	B	D	D	D	E	E	E	E	D*
Dec.	E	E	E	E	E	E	E	E	E	C	B	B	B	B	B	B	B	D	D	D	E	E	E	E	D
Jan. 77	D	D	E	D	E	D	D	E	D	C	B	B	B	B	B	B	B	C	D	D	D	D	D	D	C
Feb.	E	E	E	E	E	E	E	E	D	C	A	B	B	E	B	B	B	B	C	D	D	D	D	E	D
Mar.	D	D	D	D	D	D	D	C	B	B	C	C	C	C	C	C	C	B	C	D	D	D	D	D	C
Apr.	D	E	E	E	D	E	D	B	B	B	B	B	C	C	C	C	C	B	C	D	D	E	D	D	C
May*	D	D	D	D	D	D	D	B	C	C	D	C	C	D	D	D	D	D	C	D	D	D	D	D	C
June ¹																									
July ²																									
Aug.*	E	E	E	E	E	E	E	E	D	B	C	B	C	C	C	C	C	D	D	D	E	E	E	E	D

SOURCE: Pyranometer (Daylight Only)

MONTH	HOUR															
	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Nov. 76											D	D				
Dec.											D	D				
Jan. 77											D	D				
Feb.													D			
Mar.											D	D	D	D		
Apr.											D	D	D	D		
May											D	D	D	D		
June											D			D	D	
July											D	D	D	D	D	
Aug. *											D	D	D	D		

*Partial Data Only

¹Missing Data

²No Data. (Lightning strike)

Key:

 Unstable Class

 Neutral

 Stable Class

Table II B-84

METEOROLOGICAL SUMMARY: STABILITY CLASS FREQUENCIES (%)

Source: Met. Tower¹
(30' to 200')

Pasquill-Gifford Stability Class	dT/dz Range ¹ for this Stability Class (°C/100m)	1974		1975										Annual Mean
		Nov. ²	Dec. ²	Jan.	Feb.	Mar.	Apr.	May	June	July ³	Aug.	Sept.	Oct.	
A	<-1.9			8.3	1.0	1.1	12.0	7.4	8.6	0.0	2.4	5.8	8.1	6.1 ⁴
B	-1.9 to -1.7			5.5	4.4	10.3	23.5	30.6	25.6	85.7	19.3	23.4	20.6	18.1
C	-1.7 to -1.5			4.1	2.4	16.3	6.9	9.3	6.9	14.3	6.1	5.0	5.7	7.0
D	-1.5 to -0.5			33.0	43.4	60.9	36.3	30.0	27.0	0.0	25.8	13.4	28.3	33.1
E	-0.5 to +1.5			33.3	36.8	11.4	18.1	12.1	18.0	0.0	17.3	24.4	18.6	21.1
F	>1.5			15.8	12.0	0.0	3.2	10.6	13.9	0.0	29.1	28.0	18.7	14.6
Total Percentage				100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Pasquill-Gifford Stability Class	dT/dz Range ¹ for this Stability Class (°C/100m)	1975		1976										Annual Mean
		Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	
A	<-1.9	15.6	18.8	24.9	13.8	19.4	9.5	17.5	4.6	10.3	7.4	13.1	13.6	14.0
B	-1.9 to -1.7	19.7	20.7	21.3	22.1	27.0	21.7	26.3	17.4	30.5	18.4	25.5	20.6	22.6
C	-1.7 to -1.5	6.9	7.4	5.6	7.7	7.9	9.7	6.0	10.0	5.6	6.7	6.1	5.6	7.1
D	-1.5 to -0.5	23.7	21.5	16.6	35.7	28.7	35.2	21.0	32.7	14.1	27.6	17.5	17.9	24.4
E	-0.5 to +1.5	22.9	23.5	21.0	13.8	15.6	17.0	15.6	17.6	19.5	23.0	20.7	21.2	19.3
F	>1.5	11.2	8.1	10.6	6.9	1.4	6.9	13.6	17.6	20.0	16.9	17.1	21.1	12.6

Pasquill-Gifford Stability Class	dT/dz Range ¹ for this Stability Class (°C/100m)	1976		1977										Annual Mean
		Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June ⁵	July ⁵	Aug. ³	Sept.	Oct.	
A	<-1.9	18.6	12.3	18.0	12.9	12.9	12.6	5.9			0.7			13.3 ⁶
B	-1.9 to -1.7	19.8	20.7	18.5	27.7	21.6	29.6	13.3			14.8			21.6
C	-1.7 to -1.5	4.3	7.1	6.8	7.3	7.9	8.1	9.2			7.8			7.2
D	-1.5 to -0.5	12.5	16.2	20.9	12.1	30.1	19.0	46.6			35.5			22.5
E	-0.5 to +1.5	27.4	23.7	25.4	26.3	19.3	18.1	17.8			20.6			22.6
F	>1.5	17.4	20.0	10.4	13.7	8.2	12.6	7.2			20.6			12.8
Total Percentage		100.0	100.0	100.0	100.0	100.0	100.0	100.0			100.0			100.0

¹ Adjusted for wind speed² Data are suspect and, therefore, not included³ Partial data⁴ Averaged from January-October, excluding July⁵ Missing data⁶ Averaged from November-July

WIND PERSISTENCE AT SPECIFIED STABILITY:

<u>Table/Figure No.</u>	<u>Description</u>	<u>Page</u>
Tables II B-85 -126f	Monthly Values for Each Stability Class	II B-97 to-138f
Tables II B-127 -132	Ten Month Summary, November 1976 - August 1977	II B-139 to-144
Tables II B-133 -138	Cumulative Summary Since November 1974	II B-145 to-150

Note: No stability class data were calculated for June 1977 or for
July 1977

WIND PERSISTENCE AT SPECIFIED STABILITY

STABILITY A

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>August</u> 1977	
N	/	/	/
NNE	/	/	/
NE	/	/	/
ENE	/	/	/
E	/	/	/
ESE	/	/	/
SE	/	/	/
SSE	/	/	/
S	/	/	/
SSW	/	/	/
SW	/	/	/
WSW	/	/	/
W	/	/	/
WNW	¹ / 8-22-75	/	/
NW	/	/	/
NNW	/	/	/

WIND PERSISTENCE AT SPECIFIED STABILITY

STABILITY B

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>August 1977</u>	
N	/	/	/
NNE	/	/	/
NE	/	/	/
ENE	/	/	/
E	/	/	/
ESE	/	/	/
SE	/	/	/
SSE	/	/	/
S	/	/	/
SSW	2 / 8/27/77	/	/
SW	6 / 8/29/77	/	/
WSW	/	/	/
W	/	/	/
WNW	/	/	/
NW	5 / 8/28/77	/	/
NNW	2 / 8/22/77	/	/

STABILITY C

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>August 1977</u>	
N	<u>2</u> 8/31/77	<u> </u>	<u> </u>
NNE	<u> </u>	<u> </u>	<u> </u>
NE	<u> </u>	<u> </u>	<u> </u>
ENE	<u> </u>	<u> </u>	<u> </u>
E	<u> </u>	<u> </u>	<u> </u>
ESE	<u> </u>	<u> </u>	<u> </u>
SE	<u> </u>	<u> </u>	<u> </u>
SSE	<u> </u>	<u> </u>	<u> </u>
S	<u> </u>	<u> </u>	<u> </u>
SSW	<u> </u>	<u> </u>	<u> </u>
SW	<u> </u>	<u> </u>	<u> </u>
WSW	<u> </u>	<u> </u>	<u> </u>
W	<u> </u>	<u> </u>	<u> </u>
WNW	<u> </u>	<u> </u>	<u> </u>
NW	<u> </u>	<u> </u>	<u> </u>
NNW	<u> </u>	<u> </u>	<u> </u>

WIND PERSISTENCE AT SPECIFIED STABILITY

STABILITY D

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>August 1977</u>	
N	/	/	/
NNE	/	/	/
NE	/	/	/
ENE	/	/	/
E	/	/	/
ESE	/	/	/
SE	/	/	/
SSE	/	/	/
S	5 / 8/25-26/77	2 / 8/26/77	/
SSW	2 / 8/30/77	/	/
SW	9 / 8/30/77	6 / 8/25/77	3 / 8/31/77
WSW	/	/	/
W	/	/	/
WNW	/	/	/
NW	/	/	/
NNW	3 / 8/26/77	/	/

STABILITY E

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>August 1977</u>	
N	/	/	/
NNE	/	/	/
NE	/	/	/
ENE	/	/	/
E	/	/	/
ESE	/	/	/
SE	/	/	/
SSE	/	/	/
S	<u>2</u> / 8/26/77	/	/
SSW	<u>3</u> / 8/25/77	<u>2</u> / 8/31/77	/
SW	<u>2</u> / 8/29/77	<u>2</u> / 8/30/77	/
WSW	/	/	/
W	/	/	/
WNW	/	/	/
NW	<u>2</u> / 8/31/77	/	/
NNW	<u>2</u> / 8/31/77	/	/

STABILITY F

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>August 1977</u>	
N	/	/	/
NNE	/	/	/
NE	/	/	/
ENE	/	/	/
E	/	/	/
ESE	/	/	/
SE	² / 8/27/77	/	/
SSE	/	/	/
S	/	/	/
SSW	⁴ / 8/29-30/77	² / 8/30/77	² / 8/31/77
SW	² / 8/29-30/77	/	/
WSW	/	/	/
W	/	/	/
WNW	/	/	/
NW	/	/	/
NNW	/	/	/

STABILITY A

DIRECTION	MAX. DURATION	MONTH <u>Nov, 1976 to Aug 1977</u>			
	HRS. / DATE				
N	5 / 11-5-76	3 / 12-16-76			
NNE	4 / 11-9-76	4 / 1-30-77			
NE	2 / 11-1-76	2 / 1-11-77			
ENE	2 / 1-9-77				
E	2 / 3-12-77				
ESE	5(1) / 1-17-77				
SE	2 / 4-1-77				
SSE					
S	2 / 12-7-76				
SSW	2 / 1-22-77				
SW	2 / 12-7-76	2 / 2-8-77			
WSW	2 / 1-20-77				
W	2 / 11-15-76	2 / 1-5-77			
WNW	7 / 5-2-77	5 / 1-23-77	4 / 11-12-76		
WW	4 / 12-17-76	3 / 1-23-77	3 / 2-2-77	3 / 3-3-77	5 / 4-3-77
NNW	3 / 4-24-77	2 / 2-15-77	2 / 5-3-77		

(1) The wind pattern of ESE•ESE•E•E•ESE•ESE•ESE was recorded as 5 hrs. @ ESE and 2 hrs. @ E for January.

STABILITY B

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>Nov. 1976 to Aug. 1977</u>			
N	4 / 3-4-77	3 / 12-24-77	3 / 2-2-77		
NNE	3(1) / 3-20-77	2 / 2-14-77	/		
NE	2 / 2-14-77	2(1) / 3-20-77	2 / 4-17-77		
ENE	2 / 4-23-77	/	/		
E	/	/	/		
ESE	2 / 4-11-77	/	/		
SE	/	/	/		
SSE	2 / 4-1-77	/	/		
S	5 / 3-30-77	2 / 12-27-76	2 / 5-14-77		
SSW	9 / 3-6-77	4 / 12-7-76	4 / 1-6-77	3 / 11-13-76	3 / 2-28-77
SW	6 / 8-29-77	5 / 1-25-77	4 / 12-18-76	4 / 2-28-77	4 / 5-19-77
WSW	4 / 4-7-77	/	/		
W	6 / 2-22-77	3 / 1-28-77	/		
WNW	7 / 3-2-77	6 / 2-22-77	3 / 12-19-76	3 / 5-17-77	
NW	13 / 4-19-77	10 / 1-8-77	5 / 2-4-77	5 / 8-28-77	
NNW	6 / 4-4-77	5 / 2-25-77	3 / 12-5-76	3 / 3-5-77	

WIND PERSISTENCE AT SPECIFIED STABILITY

STABILITY C

DIRECTION	MAX. DURATION HRS. / DATE	MONTH Nov. 1976 to August 1977	
N	4 / 4-20-77	/	/
NNE	/	/	/
NE	/	/	/
ENE	/	/	/
E	/	/	/
ESE	/	/	/
SE	/	/	/
SSE	2 / 1-3-77	/	/
S	2 / 1-4-77	/	/
SSW	6 / 12-23-76	3 / 1-2-77	/
SW	4 / 1-3-77	3 / 2-22-77	3 / 5-10-77
WSW	2 / 5-20-77	/	/
W	/	/	/
WNW	/	/	/
NW	2 / 12-10-76	2 / 5-4-77	/
NNW	4 / 4-18-77	/	/

WIND PERSISTENCE AT SPECIFIED STABILITY

STABILITY D

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>Nov. 1976 to Aug. 1977</u>		
N	<u>7</u> 3-11-77	<u>4</u> 2-25-77	<u>4</u> 4-3-77	
NNE	<u>-</u> -	<u> </u>	<u> </u>	
NE	<u>2</u> 2-10-77	<u> </u>	<u> </u>	
ENE	<u>-</u> -	<u> </u>	<u> </u>	
E	<u>2</u> 2-14-77	<u> </u>	<u> </u>	
ESE	<u>-</u> -	<u> </u>	<u> </u>	
SE	<u>2</u> 1-4-77	<u> </u>	<u> </u>	
SSE	<u>3</u> 5-15-77	<u>2</u> 4-2-77	<u> </u>	
S	<u>6</u> 3-9-77	<u>6</u> 5-16-77	<u>5</u> 12-9-76	<u>5</u> 8-25-26/77
SSW	<u>13</u> 3-25-77	<u>12</u> 5-5-77	<u>9</u> 4-9-77	<u>7</u> 1-2-77
SW	<u>10</u> 3-31-77	<u>9</u> 8-30-77	<u>6</u> 8-25-77	
WSW	<u>3</u> 1-4-77	<u>3</u> 4-14-77	<u>2</u> 5-18-77	
W	<u>2</u> 12-11-76	<u>2</u> 4-5-77	<u> </u>	
WNW	<u>3</u> 11-12-76	<u>3</u> 4-10-77	<u> </u>	
NW	<u>3</u> 4-11-77	<u> </u>	<u> </u>	
NNW	<u>9</u> 3-10-77	<u> </u>	<u> </u>	

STABILITY E

DIRECTION	MAX. DURATION HRS. / DATE	MONTH Nov. 1976 to Aug. 1977			
N	/	/	/	/	/
NNE	2 / 12-16-76	/	/	/	/
NE	/	/	/	/	/
ENE	/	/	/	/	/
E	3 / 3-8-77	2 / 2-14-77	/	/	/
ESE	2 / 1-6-77	2 / 4-27-77	/	/	/
SE	2 / 12-2-76	2 / 3-12-77	2 / 4-22-77	2 / 5-16-77	/
SSE	7 / 5-6-77	4 / 1-31-77	3 / 5-22-77	3 / 4-14-77	/
S	4 / 4-9-77	3 / 12-13-76	3 / 2-12-77	3 / 5-3-77	/
SSW	6 / 2-21-77	5 / 12-29-76	5 / 3-23-77	4 / 1-11-77	/
SW	5 / 11-8-76	2 / 1-15-77	2 / 5-8-77	2 / 8-29-77	2 / 8-30-77
WSW	3 / 11-7-76	3 / 5-4-77	/	/	/
W	3 / 11-3-76	3 / 2-6-77	/	/	/
WNW	3 / 4-12-77	/	/	/	/
NW	2 / 1-14-77	2 / 3-27-77	2 / 8-31-77	/	/
NNW	2 / 8-31-77	/	/	/	/

STABILITY F

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>Nov. 1976 to Aug. 1977</u>	
N	<u>3</u> 2-7-77	<u> </u>	<u> </u>
NNE	<u> </u>	<u> </u>	<u> </u>
NE	<u> </u>	<u> </u>	<u> </u>
ENE	<u> </u>	<u> </u>	<u> </u>
E	<u>2</u> 12-17-76	<u> </u>	<u> </u>
ESE	<u>4</u> 12-11-76	<u>2</u> 2-3-77	<u> </u>
SE	<u>5</u> 1-11-77	<u>4</u> 2-8-77	<u>3</u> 3-16-77
SSE	<u>5</u> 4-8-77	<u>3</u> 12-13-76	<u> </u>
S	<u>3</u> 12-2-76	<u>3</u> 1-18-77	<u>3</u> 3-7-77 | <u>3</u> 5-8-77
SSW	<u>4</u> 8/29-30/77	<u>3</u> 1-28-77	<u>3</u> 5-10-77
SW	<u>4</u> 3-19-77	<u>3</u> 1-16-77	<u> </u>
WSW	<u>2</u> 12-25-76	<u>2</u> 2-17-77	<u>2</u> 4-21-77
W	<u> </u>	<u> </u>	<u> </u>
WNW	<u>2</u> 5-7-77	<u> </u>	<u> </u>
NW	<u> </u>	<u> </u>	<u> </u>
NNW	<u> </u>	<u> </u>	<u> </u>

STABILITY A

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>November 1974 - Aug. 1977</u>			
N	5 / 11-5-76	3 / 12-16-76	2 / 6-5-75		
NNE	4 / 12-24-75	4 / 11-9-76	4 / 1-30-77		
NE	2 / 12-8-75	2 / 4-3-76	2 / 10-1-76	2 / 11-1-76	2 / 1-11-77
ENE	2 / 9-8-75	2 / 5-23-76	2 / 7-13-76	2 / 1-9-77	
E	2 / 11-15-75	2 / 7-24-76	2 / 3-12-77		
ESE	5(1) / 1-17-77	/	/		
SE	4 / 5-6/7-77	2 / 5-21-75	2 / 8-3-75	2 / 4-1-77	
SSE	3 / 5-5-75	/	/		
S	2 / 12-7-76	/	/		
SSW	2 / 12-5-75	2 / 5-8-76	2 / 1-22-77		
SW	3 / 5-8-76	2 / 9-20-76	2 / 12-7-76	2 / 2-8-77	
WSW	2 / 8-1-76	2 / 1-20-77	/		
W	4 / 2-5-76	3 / 4-12-75	3 / 2-6-76		
WNW	7 / 3-2-77	6 / 10-27-75	/		
NW	4 / 10-24-75	4 / 3-7-76	4 / 12-17-76		
NNW	3 / 11-8-75	3 / 4-24-77	/		

(1) The wind pattern of ESE-ESE-E-E-ESE-ESE-ESE was recorded as 5 hrs. @ ESE and 2 hrs. @ E for January '77.

STABILITY B

DIRECTION	MAX. DURATION HRS. / DATE	MONTH Nov. 1974 - Aug. 1977	
N	4 / 8-4-76	4 / 9-28-76	4 / 3-4-77
NNE	3 / 9-27-75	3 / 10-17-75	3(1) / 3-20-77
NE	4 / 7-22-76	/	/
ENE	2 / 8-20-75	2 / 10-25-75	2 / 4-23-77
E	4 / 7-31-76	/	/
ESE	2 / 5-21-75	2 / 4-11-77	/
SE	2 / 5-5-75	/	/
SSE	3 / 12-6-75	2 / 5-5-75	2 / 10-26-75 | 2 / 4-1-77
S	6 / 3-31-76	5 / 12-4-75	5 / 3-30-77
SSW	9 / 3-6-77	6 / 2-11-76	5 / 8-5-75 | 5 / 3-16-76
SW	7 / 10-18-75	6 / 8-29-77	5 / 1-18-76 | 5 / 1-25-77
WSW	4 / 6-11-75	4 / 4-7-77	/
W	6 / 2-22-77	4 / 4-27-75	4 / 4-29-75
WNW	7 / 5-2-75	7 / 3-2-77	6 / 2-22-77
NW	13 / 4-19-77	10 / 1-18-77	7 / 12-14-75
NNW	6 / 5-31-75	6 / 4-4-77	/

(1) The wind pattern of NNE-NE-NNE-NE-NNE was recorded as 3 hrs. @ NNE and 2 hrs. @ NE for March '77.

STABILITY C

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>November 1974 - Aug. 1977</u>				
N	4 / 4-20-77	3 / 4-30-76	3 / 9-26-76			
NNE	2 / 9-30-75	/	/			
NE	2 / 6-16-76	/	/			
ENE	- / -	/	/			
E	- / -	/	/			
ESE	- / -	/	/			
SE	- / -	/	/			
SSE	2 / 4-25-76	2 / 7-19-76	2 / 1-3-77			
S	2 / 3-11-76	2 / 1-4-77	/			
SSW	6 / 12-23-76	4 / 3-18-75	4 / 5-15-75	4 / 3-13-76	4 / 12-15/16-75	
SW	4 / 1-5-77	3 / 4-9-75	3 / 5-18-76	3 / 6-12-76	3 / 2-22-77	3 / 5-10-77
WSW	2 / 8-25-76	2 / 3-20-77	/			
W	2 / 6-24-76	/	/			
VNW	3 / 1-1-76	2 / 4-11-75	2 / 11-29-75			
NW	8 / 10-25-75	4 / 11-18/19-75	/			
NNW	4 / 4-18-77	3 / 5-29-75	/			

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WIND PERSISTENCE AT SPECIFIED STABILITY

STABILITY D

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>November 1974 - Aug. 1977</u>			
N	7 / 3-11-77	6 / 4-30-76			
NNE	4 / 4-26-75				
NE	2 / 2-10-75				
ENE	- / -				
E	2 / 8-21-75	2 / 10-14-75	2 / 2-14-77		
ESE	2 / 7-20-76				
SE	5 / 7-23-76	2 / 3-23-75	2 / 7-9-76	2 / 1-4-77	
SSE	4 / 3-25-75	4 / 10-10-75	3 / 5-15-77		
S	14 / 5-4-75	12 / 4-25-75	11 / 3-25-75	11 / 10-11-75	
SSW	27 / 2-7-75	25 / 10-26-75	15 / 3-21-75	15 / 12-1-75	
SW	10 / 4-22-75	10 / 3-31-77	9 / 8-23-75	9 / 8-30-77	
WSW	5 / 4-9-76	3 / 4-18-75	3 / 5-15-75	3 / 11-6-75	3 / 1-4-77
W	4 / 1-25-75	4 / 2-15-75	4 / 5-16-75		
WNW	6 / 5-19-76	5 / 1-7-75	5 / 2-15-75	5 / 2-18-76	
NW	6 / 1-8-75	4 / 4-25-75	4 / 11-19-76		
NNW	9 / 5-10-77	4 / 1-9-75	4 / 1-21-75		

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STABILITY E

DIRECTION	MAX. DURATION HRS. / DATE	MONTH <u>November 1974 - Aug. 1977</u>			
N	2 / 1-27-75	2 / 9-20-75	2 / 9-30-75		
NNE	3 / 9-20-75	2 / 6-24-76	2 / 12-16-76		
NE	2 / 1-22-75	/	/		
ENE	2 / 9-11-75	/	/		
E	3 / 3-8-77	2 / 11-11-75	2 / 11-12-75	2 / 11-17-75	2 / 2-14-77
ESE	3 / 8-9-76	3 / 9-18-76	3 / 6-29/30-76		
SE	4 / 8-27-75	4 / 9-10-75	3 / 7-11-76		
SSE	7 / 5-6-77	4 / 8-27-75	4 / 10-6-75	4 / 1-31-77	
S	4 / 4-15-75	4 / 4-24-75	4 / 10-11-75	4 / 8-7-76	4 / 4-9-77
SSW	7 / 2-11-75	7 / 5-23-75	6 / 2-16-75	6 / 9-1-75	6 / 2-21-77
SW	6 / 4-13-75	5 / 1-16-75	5 / 11-8-76		
WSW	3 / 7-15-75	5 / 11-7-76	3 / 5-4-77		
W	10 / 9-19/20-76	5 / 4-12-75	4 / 2-14-75		
WNW	8 / 2-14-75	3 / 4-12-77	/		
NW	4 / 2-14-75	/	/		
NNW	5 / 1-9-75	/	/		

WIND PERSISTENCE AT SPECIFIED STABILITY

STABILITY F

DIRECTION	MAX. DURATION HRS. / DATE	MONTH November 1974 - Aug. 1977			
N	3 / 2-7-77	2 / 6-7-75	2 / 10-18-75	2 / 11-6-75	
NNE	2 / 6-4-75	2 / 9-22-75			
NE	3 / 8-30-75	2 / 8-9-75	2 / 8-10-75		
ENE	2 / 5-17-75	2 / 8-29-75	2 / 9-22-75	2 / 9-24-75	
E	3 / 1-23-75	3 / 8-3-75	2 / 8-30-76	2 / 12-17-76	
ESE	4 / 12-11-76	3 / 2-17-75	3 / 8-3-75	3 / 9-5-75	
SE	6 / 2-23-76	5 / 10-1-76	5 / 1-11-77		
SSE	5 / 4-8-77	4(1) / 12-3-75			
S	5 / 1-19-75	4 / 6-1/2-76	4(2) / 10-6-75		
SSW	6(3) / 6-5-75	5 / 10-5-75	4 / 5-28-76	4 / 8/29-30/77	
SW	4 / 1-23-75	4 / 9-6-75	4 / 3-19-77		
WSW	3 / 9-17-75	2 / 6-5-75	2 / 12-25-76	2 / 2-17-77	2 / 4-21-77
W	4 / 5-16-76	2 / 8-8-75	2 / 6-27-76		
WNW	5 / 9-17-75	3 / 9-21-75	2 / 5-7-77		
NW	2 / 1-1-75	2 / 1-29-75	2 / 8-2-75	2 / 9-29-75	
NNW	2 / 1-1-75	2 / 9-29-75			

(1) The wind pattern of SE-SE-SSE-SSSSE-SE-SSE was credited as 4 hrs. @ SSE and 3 hrs. @ SE.

(2) The wind pattern of S-S-S-SSE-SSE-SSE-S was credited as 3 hrs. @ SSE and 4 hrs. @ S.

(3) The wind pattern of SSW-SSW-S-S-S-SW-SSW-SSW-S was credited as 6 hrs. @ SSW and 3 hrs. @ S.

RADIAN

CORPORATION

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(100-152)

AIR MONITORING REPORT
FOR
C-b SHALE OIL PROJECT
JULY 1977
Report No. 35

4 October 1977

Presented to:
C-b Shale Oil Project
United Bank Tower
Denver, Colorado 80202

Prepared by:
Radian Staff

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I. GENERAL DESCRIPTION OF AIR MONITORING PROGRAM

Radian Corporation, under contract to the C-b Oil Shale Project, is performing the data compilation and reporting of air quality and meteorological data at one monitoring site in Northwest Colorado. The site measures and records concentrations of particulates, sulfur dioxide, oxides of nitrogen, hydrogen sulfide, total hydrocarbons, methane, and carbon monoxide. A 200-foot meteorological tower provides wind direction, wind speed, temperature, and relative humidity data at four levels (8, 30, 100, and 200 feet). Other meteorological variables measured at the tower site are insolation, barometric pressure, and precipitation.

Figure I shows the configuration of the monitoring station. The station provides a sturdy and protective covering for the monitoring equipment.

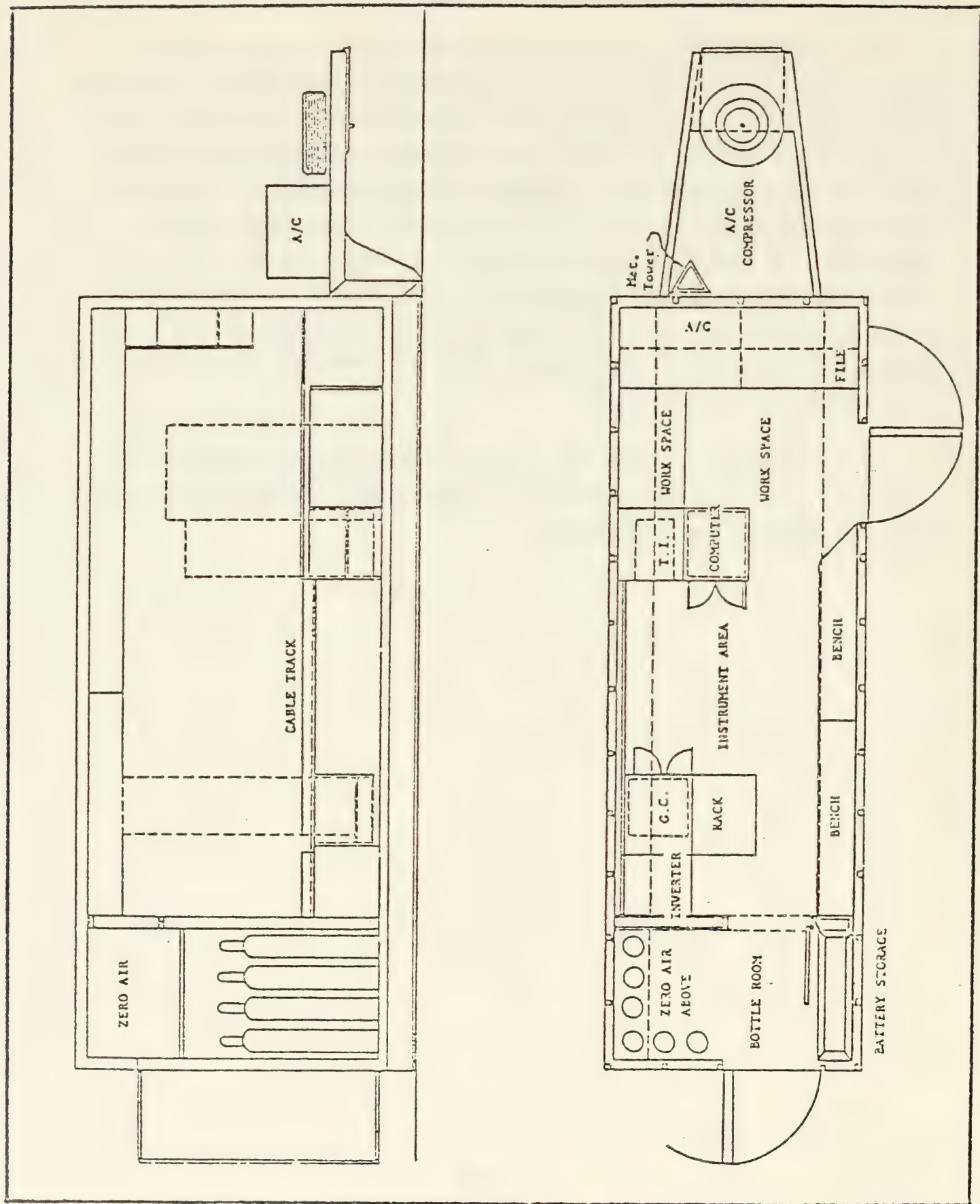


FIGURE I. CONFIGURATION OF MONITORING STATION

A. Air Quality Instrumentation

Nitrogen oxides are measured with a Meloy Model NA520 analyzer. This dual-channel analyzer is based on the chemiluminescent principle and continuously monitors both NO_x and NO. A subtraction circuit in the instrument provides a continuous NO_2 output, but is not used in Radian's system. NO_2 is calculated once a second by the computer by subtracting the NO value from the NO_x value, thus avoiding any drift which might occur in the NO_2 output of the instrument. This instrument has a minimum detectable sensitivity of 5 ppb (parts per billion) and a linearity of $\pm 1\%$.

Sulfur dioxide is measured with the Meloy SA185-2A analyzer while hydrogen sulfide is measured with the Meloy SA185-2 analyzer. The hydrogen sulfide analyzer uses a Meloy Model SO_2 -1 sulfur dioxide scrubber and the sulfur dioxide analyzer uses a Meloy Model H_2S -1 hydrogen sulfide scrubber. The Model SA185-2 is a continuous analyzer and utilizes the flame photometric principle of operation. The minimum detectable sensitivity for the Model SA185-2 is 5 ppb with a linearity of $\pm 1\%$ and the minimum detectable sensitivity for the Model SA185-2A is 2 ppb with a linearity of $\pm 1\%$.

Ozone is measured with a Meloy Model OA350 analyzer. This instrument, based on the chemiluminescent principle, provides continuous measurement of ozone. The minimum detectable sensitivity is 0.5 ppb and the linearity is $\pm 1\%$.

Total hydrocarbons, methane, and carbon monoxide are monitored with a Bendix Model 8200 gas chromatograph analyzer. This instrument, which uses a plume ionization detector, has a minimum detectable sensitivity of 5 ppb for all three components. The Model 8200 works on a five-minute cycle, i.e., one air sample is analyzed every five minutes, and the results are displayed for five minutes via a sample and hold circuit.

The air sample is drawn in through a glass cane and manifold supplied by the Ace Glass Company. The system has a 25mm diameter, through which a constant air flow is provided by an air pump rated at 60 cfm at 0" head pressure. The manifold has sampling ports to which 1/4" teflon lines to the instrument are connected. All joints in the sampling system are secured by O-ring compression fittings. The manifold is contained in a heated (100°F) chamber to prevent condensation of moisture. The teflon lines from the manifold to the instruments are insulated with 1/8" wall thickness rubber tubing.

The trailer has four heavy duty high volume particulate samplers (Hi-Vols). Fiberglass filter paper is used for the collection of particulate samples, after which each filter is brought to a controlled humidity before weighing. Each Hi-Vol has a flow recorded to permit correction for changes in air flow as the filter becomes loaded with particulates. Each Hi-Vol runs for a 24-hour period (midnight to midnight) and is turned on and off by the computer. The Hi-Vols, which were manufactured by Radian, were designed following guidelines recommended by the Environmental Protection Agency.

In addition to the normal Hi-Vol particulate samples, a duplicate Hi-Vol sample is collected every sixth day on special filter paper for trace element analysis. Once each quarter these samples are composited and analyzed for gross radioactivity and trace element content.

B. Calibration Procedures

The trailer contains a Meloy Model RAD-1 calibration unit. This instrument provides a zero air supply, SO₂ span gas from an SO₂ permeation tube, and NO span gas obtained by precisely

diluting bottled NO span gas. The computer-controlled calibration of all instruments is automatically performed once a day. Each instrument is first switched to zero; the computer monitors the output of each channel and takes a new zero reading after a stable zero signal has been reached. This zero reading is compared by the computer to the zero reading obtained 24 hours before, and if a drift in excess of 10 ppb has occurred, an excess zero drift light for the channel in question is turned on on the System Status Panel. Next, span gas is supplied to each channel and the computer decides when a stable span value has been reached. This value is recorded and compared to the previous day's value. An excess span drift light on the System Status Panel is turned on if a drift exceeding 10 ppb occurs. The instruments are then returned to the monitor mode and after two minutes the computer resumes data taking.

The bottled NO gas used at each site was obtained from Precision Gas Products. Pre-purified grade hydrogen is used in the SO₂ analyzers.

The SO₂ permeation tubes were manufactured by Metronics Association, Inc. Their output has been verified by comparison to the output of National Bureau of Standards tube 10-42. Both SA185 analyzers in each trailer are calibrated with the SO₂ from the permeation tube. This instrument responds to the number of sulfur atoms per molecule; thus, SO₂ can be used to calibrate both the H₂S and SO₂ monitors.

The Model OA350 ozone analyzer has its own calibration system which provides a zero check and a span check. The ozone calibration system is verified by comparison to a calibrated ozone generator maintained in Radian's laboratory in Rifle.

The Model 8200 total hydrocarbon, methane, and carbon monoxide analyzer is calibrated with undiluted span gas obtained from AirCo's Rare and Specialty Gas Division. This span gas contains methane and carbon monoxide in air, the methane being used to calibrate both the total hydrocarbon channel and the methane channel. The Model 8200 is zeroed with air from a Bendix Model 8834 zero air unit. In addition, the instrument is electronically re-zeroed at the start of every five-minute cycle.

The Hi-Vol particulate samplers were calibrated using a Calibration Kit from General Metal Works.

C. Data Acquisition System

The basis of the data acquisition system is a Data General NOVA 1200 minicomputer. The NOVA, which has a basic cycle time of 1.2 μ sec, is equipped with automatic program load and power fail/automatic restart features. The computer utilizes 16K 16-bit words of core memory. Analog-to-digital conversion is accomplished via an ADC built by Radian Corporation. The input/output unit for the system is Texas Instrument's KSR 733 keyboard/printer. This model teletype provides keyboard entry and hardcopy printed output. The data are also recorded on a cassette magnetic tape unit with three drives. The cassette unit is utilized for program storage and loading as well as for recording. To reduce wear on mechanical parts, the power to the teletype and cassette units is turned on only when the unit(s) is (are) to be used. Several important functions in the instruments as well as in the computer and the trailer are monitored by means of lights on a System Status Panel. These data lights are written onto cassette tape to monitor the complete status of the system every five minutes. The Data Acquisition System also monitors the presence of 100V power from the power lines. In its absence, the computer, which is powered by batteries, switches all trailer

systems to battery-provided power. If the line voltage is restored before the batteries are discharged to a specified level, the trailer system is switched back to line power.

D. Meteorological Instrumentation

200-Foot Meteorological Tower

The tower has instrumentation at four levels: 8 feet, 30 feet, 100 feet, and 200 feet. At all four levels, there are: wind speed, wind direction, and temperature and relative humidity sensors in a power-aspirated radiation shield. Temperature difference thermistors (also in power-aspirated radiation shields) and their associated circuitry take lapse rate measurements for the 30-foot to 100-foot layer and the 30-foot to 200-foot layer. In addition, this site has a Precision Spectral Pyranometer, a barometer, and a tipping bucket rain/snow gage.

The wind direction and speed apparatus used at each measurement level of the tower is the Model 1074-2 wind sensor by Meteorological Research, Inc. (MRI). This sensor has a 540° potentiometer for wind direction and a light chopper for wind speed. This sensor is rugged, with an all-weather coaxial cup and damped vane assembly. The prototype model has been in operation for years under the most demanding weather conditions, performing continuously with the utmost reliability. The wind sensors on the tower have been specially treated with a black paint which will promote warming of the exposed surfaces of the sensor and thereby reduce ice and snow accumulations on the moving parts of the apparatus. The specifications on the Model 1074-2 are as follows:

Wind Speed

- . Starting Threshold: 0.75 mph.
- . Response Distance: 18 feet (63% recovery).
- . Flow Coefficient: 7.9 feet/Revolution.
- . Accuracy: ± 0.4 mph or 1% (whichever is greatest)

Wind Direction

- . Starting Threshold: 0.75 mph.
- . Delay Distance: 4 feet (50% recovery).
- . Damping Ratio: 0.5 to 0.6.
- . Accuracy (540° system): $\pm 1\%$.
- . Range: 0° to 540°.

The relative humidity and temperature sensors are mounted within a power-aspirated radiation shield at each tower level. All aspirators and sensors are of the Model 840 Series by MRI. The aspirated shielded housing is designed to provide maximum radiation protection to the sensor. Ambient air is drawn into the shield and across the sensors at approximately 15 feet per second. This intake air is essentially sampled from a hemispherical space which is approximately 3-inch radius from the tube opening. Speed of the incoming air at the periphery of this hemisphere is approximately 1 mph.

The temperature sensor is comprised of a dual thermistor and resistor network. This circuit provides a linear resistance change with an air temperature change. The relative humidity sensor is placed alongside the temperature elements inside the shield where it is exposed to a constant flow of air. Circulation to both sides of the sensing element produces accurate monitoring with a good response time. The specifications on the sensing elements are as follows:

Temperature

- . Accuracy: $\pm 0.25^{\circ}\text{C}$.
- . Range: -50°C to $+50^{\circ}\text{C}$.

Humidity

- . Accuracy: $\pm 3.0\%$ RH.
- . Range: 0% to 100% Relative Humidity.

Measurements of temperature difference are taken for two layers, the 30-foot to 100-foot and the 30-foot to 200-foot layer. The thermistors and circuitry used for these measurements are separate from the thermistors measuring air temperature. The use of separate thermistors and circuitry to measure ΔT allows for much greater accuracy and resolution in the measurements, which is necessary for stability assessments. Two ΔT thermistors are at the 30-foot level, one is at the 100-foot level, and one is at the 200-foot level. All of these ΔT thermistors are mounted within power-aspirated radiation shields. The specifications on the ΔT instrumentation are as follows:

- . Accuracy: $\pm 0.1^{\circ}\text{C}$.
- . Range of ΔT Circuit (Lower Level-Upper Level):
 $+9\text{F}^{\circ}$ to -9F° .

All instrumentation, except at the ground level, is mounted at the end of 12-foot retractable booms. These booms are 3-inch box beams which are on rollers and can be retracted to the instrument platforms for instrument maintenance.

The meteorological tower itself is a 200-foot Rohn Model 80 Guyed Tower, designed for 40 pounds per square foot wind load with $\frac{1}{2}$ " of radial ice per EIA Standard RS-222-B, to

support four levels of meteorological equipment. The material consists of tower sections with a tapered base, three retractable booms 12-feet long, three outside work platforms, an inside ladder for climbing, two base ground kits and one anchor ground kit. The cable-type Safety Climbing Device consists of a cable and attachment mechanisms with a locking sleeve and safety belt. The tower is lighted and painted according to FAA specifications.

The signals from the tower instrumentation are fed from multiple signal cables into transmitters mounted at the base of the tower. After signals have been converted to analog signals, they are fed into a junction box, also at the tower base, where they are assimilated into one coaxial cable. The signals are then run underground within 3" PVC conduit to the A-to-D assembly, where they are processed. The transmitters are shielded and insulated from the elements. The signal cable is run underground in PVC conduit in order to minimize damage from the weather or from various rodents in the region.

The auxiliary equipment at the tower site consists of a heated tipping bucket rain/snow gage, an analog barometer, and a Precision Spectral Pyranometer. The rain/snow gage is the Model P511-E unit by Weather Measure. In the case of this gage, the durability and reliability of a tipping bucket gage are combined with heavy-duty electric heaters to make this an all-purpose precipitation sensor. This gage may be used to measure both snowfall and rainfall. An insulating cover of poly-vinyl chloride and a thermostatic control insure the proper gage temperature. The thermostatic control is adjustable from 0 to 35°C. Snow falling into the inlet funnel is melted. The resulting water (from rain or snow) drains into a precision tipping bucket mechanism which activates a mercury switch each time the bucket fills and tips. The gage is constructed of durable corrosion-resistant materials to provide many years of service. The

specifications for this gage are as follows:

- . Orifice: 8 inches.
- . Calibration: 0.01 inch.
- . Accuracy: 0.5% (Calibrated at 0.5 in/hr).
- . Sensor: Chrome-plated tipping buckets.
- . Switch: Mercury, 0.1-second closure.
- . Heat Control: Thermostat adjustment, 0 to 35°C.

The barometer is the B242 Analog Output Barometer by Weather Measure. This barometer provides an output voltage that is linearly proportional to pressure. The specifications on this instrument, which is mounted inside the monitoring trailer at the site, are as follows:

- . Range: Specially designed for the 100 millibar interval from 725 millibars to 825 millibars.
- . Resolution: Infinite.
- . Linearity: ± 0.5 millibar, over the 100 millibar interval.

The pyranometer at the site is the Eppley Precision Spectral Pyranometer. This instrument is used for the measurement of sun and sky radiation totally or in defined wavelength bands. The pyranometer is levelled and mounted atop a wooden stand $4\frac{1}{2}$ feet from the ground surface. Care has been taken to eliminate the effects from all outside influences, such as reflection or shadows, on the pyranometer. The instrument characteristics are as follows:

- . Sensitivity: 5 mv. per cal/cm²/min.
- . Independence: 300 ohms.
- . Temperature dependence: Sensitivity constant to within ± 1 percent over the ambient temperature range from -20 to +40°C..

- . Linearity: Response linear up to intensities of $4 \text{ cal/cm}^2/\text{min}$.
- . Response time: 1 second (i/e signal).

All instrumentation is factory-calibrated and is field-calibrated at various intervals. Sling psychrometers are used to calibrate the humidity sensors; known temperatures and/or resistances are used to calibrate the thermistors; and an rpm calibrating unit is used to calibrate the anemometers. The wind direction instrumentation is aligned to true north (reference direction) by means of a surveyor's transit.

III. MICROMETEOROLOGICAL AND TERRAIN FEATURES

The Piceance Creek Valley and C-b Shale Oil Tract are situated such that many microscale meteorological phenomena affect the region where the ambient air monitoring unit is located. Trailer 023 and its associated 200-foot meteorological tower are located atop a plateau to the south of the valley, high enough to be affected mostly by gradient flow conditions.

The elevation at the meteorological tower site (Trailer 023) is 6940 feet above sea level. The largest gradients in elevation in this area, of course, occur at the Piceance Creek Valley walls. However, the northern valley walls are slightly steeper than those at the southern boundary of the valley, which then slopes upward gradually toward the C-b Tract. The Piceance Creek Valley decreases in elevation from east to west in this area, so that nighttime katabatic cold-air drainage flows advect from east to west.

Site 023 is approximately 2.5 miles south of the Piceance Creek Valley. This location is relatively high compared to its surroundings, with the nearest point having an elevation greater than 7000 feet being .5 miles to the south of the tower. The tower itself is on the top of a small knoll located between Scandard and Sorghum Gulches. Because of its location and the irregularities of the surrounding terrain, meteorological patterns are varied here.

Wind instrumentation is mounted at four levels of the meteorological tower: 8 feet, 30 feet, 100 feet, and 200 feet. The top level of the tower generally remains in gradient wind flow. That is, the winds at that level are normally generated

by synoptic-scale features and are usually separated from terrain features and micrometeorological circulations. Occasionally, a weak anabatic flow influence is experienced. However, such is not the case with the three lowest measurement levels. To varying degrees, these levels are influenced by both the katabatic and anabatic circulation cells. However, when strong pressure gradient forces exist in the region and the synoptic-scale wind flow is strong, all four tower levels will reflect a gradient wind flow as the winds increase in strength and height.

The terrain atop the plateau is generally barren and fairly rugged, with a few scattered small trees. The topsoil dries rapidly and is very fine, resulting in blowing dust when dry, windy conditions exist. In the Piceance Creek Valley, the terrain is fairly grassy and flat, with steep valley walls on either side. Surface winds are normally rather light in this valley unless channeling effects occur.

During clear nights with rather light pressure gradient-induced winds, rapid radiational cooling will occur in the region because of the barren nature of the terrain and the generally dry character of the air in this portion of the country. As a result, the diurnal range of temperatures will be extremely large. Because of the katabatic flow in the valley, nighttime temperatures will generally be lower in the valley than on the plateau. During the winter, especially, temperatures in the valley may be 20F° lower than they are on the plateau during the early morning hours.

IV. OPERATING TIME ANALYSIS FOR EACH SITE

This section presents the operating statistics for each of the major subsystems contained in the monitoring station. Table I shows the specific number of hours that each of these subsystems were inoperative for the month. The column labeled "DIGITIZING SYSTEM" indicates the entire data acquisition system; therefore, downtime hours appearing in this column means total loss of data. These instances include, in addition to computer downtime, power failures, no power available, and self-automated shutdown periods such as during air conditioner malfunctions.

Calibration time is not considered to be downtime and is, therefore, not included in the downtime figures. The amount of time used in calibrating the instruments is given at the bottom of the downtime analysis table and is reported as total calibration hours for each channel for the entire month. As is evident in the calibration figures, channels can be calibrated independently of one another. No calibration time is given for particulate monitoring since Hi-Vol calibration occurs infrequently and only during the off-duty cycle for each Hi-Vol while another Hi-Vol is taking data.

TABLE I.
DOWNTIME HOURS FOR C-B SHALE OIL PROJECT

SHEET NO. 2

DESTILLING

DATE	SYSTEM	WS1	WD1	RH1	TMP1	WS2	WD2	RH2	TMP2	WS3	WD3	RH3	TMP3	WS4	WD4	RH4	TMP4	DT1	DT2
7/1	1	0.	0.	14.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	0.
7/2	2	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/3	3	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/4	4	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/5	5	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/6	6	0.	0.	0.	0.	0.	0.	24.	1.	0.	0.	24.	1.	0.	0.	24.	24.	24.	24.
7/7	7	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/8	8	0.	0.	0.	1.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/9	9	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/10	10	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/11	11	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/12	12	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/13	13	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/14	14	0.	1.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/15	15	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/16	16	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/17	17	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/18	18	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
7/19	19	11.	0.	0.	0.	0.	0.	13.	0.	0.	0.	13.	0.	0.	0.	13.	0.	13.	13.
7/20	20	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7/21	21	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7/22	22	10.	11.	11.	3.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.
7/23	23	0.	24.	24.	1.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/24	24	0.	24.	24.	0.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/25	25	0.	24.	24.	0.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/26	26	0.	24.	24.	0.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/27	27	0.	24.	24.	0.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/28	28	0.	24.	24.	0.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/29	29	1.	23.	23.	0.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.
7/30	30	0.	24.	24.	2.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/31	31	0.	24.	24.	0.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
CAL TIME		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

TABLE I.
 DOWNTIME HOURS FOR C-B SHALE OIL PROJECT

SITE #23

DATE	BWS1	HWD1	VWD1	BWS2	HWD2	VWD2	BWS3	HWD3	VWD3	WSD1	WSD2	WSD3	WSD4	HSD1	VSD1	HSD2	VSD2	HSD3	VSD3
7/1	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/2	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/3	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/4	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/5	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/6	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/7	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/8	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/9	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/10	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/11	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/12	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/13	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/14	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/15	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/16	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/17	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/18	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
7/19	13.	13.	13.	13.	13.	13.	13.	13.	0.	0.	0.	0.	0.	13.	13.	13.	13.	13.	0.
7/20	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7/21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7/22	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.
7/23	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/24	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/25	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/26	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/27	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/28	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/29	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.	23.
7/30	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
7/31	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
CAL TIME	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

V. MONTHLY METEOROLOGICAL SUMMARY

A. Summary of the Meteorological Conditions over
North America during July 1977

July 1977 brought near normal temperatures to the northeastern and western sections of the country, while all other sections of the United States experienced slightly above normal or above normal temperatures. Precipitation totals were below normal in the eastern and southern sections of the country and near normal in all other sections. The polar front jet stream was located in the northern United States resulting in the below normal precipitation totals in the southern sections of the country. The long wave circulatory pattern featured zonal flow throughout the month, mainly in the northern half of the country. High pressure systems dominated the southern United States in typical summer-like fashion.

Extratropical low pressure systems were infrequent in the United States during July because of the weakness and northern location of the polar front jet stream. The low pressure systems primarily affected the Great Plains. The dates and locations of these low pressure systems are as follows:

5th:	Great Plains
6th-7th:	Great Lakes
8th:	New England
13th:	Northern Great Plains

On a sectional basis, the following temperature and precipitation anomalies existed during July.

<u>Section</u>	<u>Temperature</u>	<u>Precipitation</u>
Northeast	Near normal	Near normal
Atlantic Seaboard	Slightly above normal	Below normal
North Central	Above normal	Variable; mostly near normal
Central	Slightly above normal	Variable; mostly near normal
Southeast	Above normal	Below normal
Southwest	Slightly above normal	Much below normal
Rockies	Near normal	Variable; mostly above normal
West and Pacific	Near normal	Variable; mostly near normal
Northwest		

B. Summary of the Meteorological Conditions in
Northwestern and West Central Colorado during
July 1977

Grand Junction, Colorado, sixty miles to the south-southwest of the Tract C-b, received a total of 0.89 inch of precipitation during July, which is 0.43 inch above the monthly normal of 0.46 inch. Measurable precipitation (≥ 0.01 inch) occurred on the 4th, 5th, the 18th through the 22nd, the 24th, and the 27th. The region received 75 percent of the possible monthly sunshine. Sky cover by cloudiness averaged 4.7 out of a possible 10 during the daylight hours and 4.5 out of a possible 10 during the entire month. The region had twelve clear days, twelve partly cloudy days, and seven cloudy days during the month.

Air mass changes occurred in the region with a frequency of about once every five days during July. Temperatures were warm and slightly above normal. Transport winds were not as strong as those winds which prevailed in the area during June. Six cold fronts, all of maritime polar origins, passed through the region during July. These cold frontal passages occurred on July 3rd, 7th, 10th, 14th, 23rd, and 30th.

C. Summary of the Meteorological Conditions in the
Oil Shale Tract C-b Region during July 1977

Several short waves moving through an essentially zonal flow pattern accounted for the above normal precipitation total in the Tract C-b region during July. Precipitation occurred on the 4th, 6th, 18th, 19th, 23rd, 24th, and the 29th. Temperatures in the Tract C-b region were near normal compared to the above normal temperatures recorded east of the Rocky Mountains. Six maritime polar cold frontal passages occurred during July. These frontal passages occurred on the 3rd, 7th, 10th, 14th, 23rd, and 30th.

There is no temperature data at the 30- and 100-foot levels of the tower after the 19th because of a lightning strike. The 8-foot level became operative again on the 23rd. The 200-foot level was inoperative during all of July except for the one week period from July 11th through the 19th. Nevertheless, monthly average temperatures recorded at the meteorological tower during July were 67.9°F at 8 feet, 69.5°F at 30 feet, and 69.2°F at 100 feet. These averages are approximately 2°F higher than those recorded during June. The warmest days of the month were the 9th, 10th, and the 12th through the 17th. The coolest days were the 4th, 5th, 23rd, and the 24th. The highest temperature recorded at the meteorological tower during July was 88°F at the 8-foot level on the 8th. The coldest temperature recorded at the meteorological tower was 48°F at the 8-foot level on the morning of the 28th.

Relative humidity data was obtained only at the 8-foot level of the meteorological tower during July. Data was obtained until the 19th of July when lightning struck the tower. The average relative humidity for this period was 31.6 percent. The most humid days at the 8-foot level were the 4th, 5th, and the

19th. The driest days were the 8th through the 12th.

Wind speed and wind direction data was obtained at the meteorological tower from July 1st through the 19th. Resultant wind vectors at the meteorological tower during July were as follows: 213.6 degrees at 4.1 miles per hour at 8 feet; 205.9 degrees at 5.5 miles per hour at 30 feet; 204.2 degrees at 6.3 miles per hour at 100 feet; and 213.8 degrees at 7.2 miles per hour at 200 feet.

The scalar average wind speeds associated with these resultant wind vectors were 6, 9, 10, and 11 miles per hour, respectively. The Ekman spiral and Ekman effect, i.e., a veering in direction and increase in speed as a function of increasing height above the surface, were in evidence during most of July. A reference to the July wind rose for the meteorological tower indicates that the winds at that location were primarily south-southwesterly with a high percentage of southwesterly winds in addition.

The windiest days of the month at the meteorological tower were the 9th, 10th, and the 13th. The days having the lightest winds were the 16th and the 17th. The highest five-minute average wind speed recorded at the tower during July was 44 miles per hour at the 200-foot level on the 1st.

Precipitation totals in the Tract C-b monitoring network during July were generally above normal. During July 0.89 inch of precipitation was recorded at the meteorological tower. The largest daily precipitation total recorded in the network during July was 0.23 inch on July 23rd. The greatest five-minute precipitation total recorded during the month was 0.11 inch (a precipitation rate of 1.32 inches/hour), recorded on the 23rd. Measurable precipitation ($\geq .01$ inch) was recorded at the meteorological tower on the 4th, 6th, 18th, 19th, 23rd, 24th, and the 29th.

The monthly average station pressure during July was 794.2 millibars at the meteorological tower. This reading is 2.9 millibars higher than the June average station pressure of 791.3 millibars. The highest daily average station pressures occurred on the 25th through the 28th and the 31st. The lowest daily average station pressures occurred on the 2nd, 3rd, 4th, and the 10th.

Cloudiness increased in the Tract C-b region during July, compared to the June cloud cover and insolation statistics. The region received an insolation total of 14,515.9 langleys during a 27-day period, which is equivalent to a daily average insolation total of 538 langleys/day. This average is below the normal for July of 610 langleys/day in the Tract C-b region. On a diurnal basis, the greatest solar radiation rates occurred between 1100 and 1200 hours. The greatest daily radiation totals were received on the 10th, 11th, and the 12th. The lowest daily solar radiation totals were received on the 4th, 23rd, and the 27th. The greatest five-minute radiation total received during July was 8.75 langleys (a rate of 1.75 langleys/minute), which occurred on the 1st. The largest hourly insolation total received during July was 85 langleys, which occurred on the 10th between 1200 and 1300 hours.

Because of the progressively decreasing solar elevations and the increasingly shorter periods of daylight that prevailed during July, the total possible solar radiation which could be received during a day decreased monotonically throughout the month.

The increase in cloudiness which affected the Tract C-b during July caused the "very unstable" stability classes to

become less common than they had been in June. Using the Pasquill method of stability determination, "D" stability (neutral stability) was the most common stability, occurring during 144 daytime hours, or 55 percent of the time. In decreasing order of frequency, "C" (slightly unstable) stability occurred during 79 hours, or 30 percent of the time, and "B" (very unstable) stability occurred during 37 hours, or 14 percent of the time. "A" (extremely unstable) stability did not occur.

There is no lapse rate method of stability data since the $(\frac{dT}{dz})$ sensors were inoperable for the entire month.

Using the standard deviation of the horizontal wind (σ_θ) method of stability determination, "E" stability was the most common stability classification at the 30-, 100-, and 200-foot levels due to the moderately strong winds at those levels. At the 8-foot level, the "D" stability classification was the most common stability classification. The stability distributions for the 30-, 100-, and 200-foot levels were similar. The 8-foot level of the tower exhibited higher percentages of the unstable classes because of excessive mechanical turbulence.

No vertical direction wind data was obtained from the bivanes during July. The bivane at the 200-foot level was inoperable during the entire month, and the other two bivanes were being repaired. Also, no comparison may be made of σ_θ values between the bivanes and the standard wind instrumentation.

VI. DATA PRESENTATION AND SUMMARY

This section includes summaries for various recorded data at the monitoring sites. The data presentations indicate the variability of pollutant concentrations and meteorological parameters with location and time. In addition, the presentations indicate the functional dependence of pollutant concentration with wind direction. All data except suspended particulates (24-hour samples) are sampled once each second, but recorded as five-minute arithmetic averages of the one-second samples. This averaging technique tends to smooth instantaneous maximum values, and is especially evident when comparing wind gusts to local weather bureau data.

Inherent to any data acquisition system is random noise both from the recording instruments and quantization in the analog-to-digital conversion. The lower threshold for all analytical instruments is twice the maximum noise level generated by the instruments. This lower threshold is 5 ppb for all instruments, except for the ozone analyzer, for which it is 0.5 ppb. Therefore, any values appearing in the data presentations that are less than 5 ppb indicate only a trace of pollutant in question and should not be construed to be absolute levels. In addition, the recorded quantity is simply random noise and averages tend toward zero. Thus, when concentrations are below the lower threshold of the analytical instruments they may appear as a zero entry in the data presentation which does not indicate absolute zero concentration.

All pollutant data (except for particulate data) is taken at the monitoring site in integer parts per billion (ppb) but is presented here in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)

assuming standard temperature and pressure of 25°C and 760 mmHg (1013.2 millibars), respectively. The scale factors required to convert $\mu\text{g}/\text{m}^3$ at standard conditions back to ppb for the various pollutants are given in the following table.

POLLUTANT	TO CONVERT $\mu\text{g}/\text{m}^3$ AT 25°C AND 760 mmHg TO ppb MULTIPLY BY
NO _x	.534
NO	.534
NO ₂	.534
SO ₂	.384
H ₂ S	.723
THC	1.536
CH ₄	1.536
CO	.877
O ₃	.512

The units of the meteorological parameters are given in the table. It should be noted here that inside temperature is monitored and recorded as a functional part of the system but is not presented in this report.

Table III displays the monthly statistics for each monitoring station for the month. To insure statistical significance, and to reduce the possibility of introducing a bias in the presentation, averages are computed only when at least 50 percent of the samples are present, except for relative humidity and temperature, in which case 75 percent of the samples are required. If less than the required samples are present for a particular parameter, that entry will be blank. The number of

samples present for a particular channel is defined as the total possible number of five-minute samples for the averaging time less the computer downtime less the channel downtime less the channel calibration time. The averages in Table III are arithmetic averages with the following exceptions:

- Wind speed and wind direction are computed using a vector averaging technique where the wind speed is treated as the vector magnitude.
- Particulate averages are computed as the geometric mean.

Table IV displays the daily averages. Again, 50 percent of the five-minute samples are required in order to compute an average except for the cases of relative humidity and temperature which require 75 percent. A blank entry indicates an insufficient number of five-minute samples present for that day. Wind speed, wind direction, and particulate averages are computed the same way as described in Table III.

Table V presents the maximum daily five-minute average retained in the data base as well as the time of occurrence. A five-minute maximum average is printed if any samples are present for that day. Therefore, the maximum five-minute average for a channel which experienced considerable downtime or calibration time during the day in question may be misrepresentative of the maximum expected for that channel on that day.

Table VI indicates the five largest averages for various averaging times. The table shows the period of time covered by the average. Maxima are chosen so that time segments

are independent. The maximum averages reported are found using a 'sliding average' technique with the exception of the 24-hour particulate average, which is computed from midnight to midnight. For averaging times less than or equal to three hours, the sliding average is stepped one five-minute sample at a time. For longer averaging times the step size is twelve samples or one hour. For averaging times less than or equal to one hour 100 percent of the five-minute samples must be present to compute an average. Averaging times greater than one hour require 90 percent. Whether or not a sliding average is computed is solely determined by the number of samples present in that averaging time and is independent of daily and monthly averaging criteria.

To demonstrate the functional dependence of recorded parameters upon wind direction, Table VII shows pollutant concentration displayed in a bi-variate distribution with wind direction. The tables display the total number of five-minute samples occurring in each concentration and wind speed class. The mean concentration for all samples occurring in each wind class are also shown. This distribution demonstrates the dependence of high pollutant concentrations upon wind direction. Appendix A shows the stability wind rose diagrams.

The wind speed classifications used in Appendix A are based on the Beaufort wind scale classification system. This is a system of estimating and reporting wind speeds, invented in the early nineteenth century by Admiral Beaufort of the British Navy. It was originally based on the effects of various wind speeds on the amount of canvas that a full-rigged frigate of the period could carry, but has since been modified and modernized. In its present form for international meteorological use it equates: (a) Beaufort force (or Beaufort number); (b) wind speed;

(c) descriptive terms; and (d) visible effects upon land objects or the sea surface. One land adaptation is the NRM wind scale.

The six basic wind speed classifications used in the report are: 1-3 knots, 4-6 knots, 7-10 knots, 11-16 knots, 17-21 knots, and winds of greater than 21 knots. The following table is a complete description of the Beaufort Wind Scale, taken from Physical Climatology, by Helmut Landsberg, 1969.

BEAUFORT WIND SCALE FOR OBSERVATIONS AT LAND STATIONS

Force	Explanatory Title	Specification for Use	Corresponding Limits of Wind Speed at 10 meters ab.grd.				
			Mi/hr.	Knots	Km/hr.	M/sec.	Ft/sec.
0	Calm.....	Smoke rises vertically.....	<1	<1	<1	0.3	1
1	Light air.....	Direction of wind shown by smoke drift, but not by wind vanes.....	1-3	1-3	1-5	0.3-1.5	1-5
2	Light breeze....	Wind felt on face:leaves rustle:ordinary vane moved by wind.....	4-7	4-6	6-11	1.6-3.3	6-11
3	Gentle breeze....	Leaves and small twigs in constant mo- tion;wind extends light flat.....	8-12	7-10	12-19	3.4-5.4	12-18
4	Moderate breeze..	Raises dust and loose paper:small bran- ches are moved.....	13-18	11-16	20-28	5.5-7.9	19-26
5	Fresh breeze....	Small trees in leaf begin to sway:wave- lets formed on inland waters.....	19-24	17-21	29-38	8.0-10.7	27-35
6	Strong breeze....	Large branches in motion:whistling heard in telegraph wires:umbrellas used with difficulty.....	25-31	22-27	39-49	10.8-13.8	36-45
7	High wind.....	Whole trees in motion:inconvenience felt when walking against wind.....	32-38	28-33	50-61	13.9-17.1	46-56
8	Fresh gale.....	Breaks twigs off trees:generally impedes progress.....	39-46	34-40	62-74	17.2-20.7	57-68
9	Strong gale.....	Slight structural damage occurs (chimney pots and slates removed).....	47-54	41-47	75-88	20.8-24.4	69-80
10	Whole gale.....	Seldom experienced inland:trees uprooted: considerable structural damage occurs...	55-63	48-55	89-102	24.5-28.4	81-93
11	Storm.....	Very rarely experiences:accompanied by widespread damage.....	64-72	56-63	103-117	28.5-32.6	94-106
12	Hurricane.....	.....	73-82	64-71	118-133	32.7-36.9	107-121
13	.....	.....	83-92	72-80	134-149	37.0-41.4	122-136
14	.....	.....	93-102	81-89	150-166	41.5-46.1	137-151
15	.....	.....	104-114	90-99	167-183	46.2-50.9	152-166
16	.....	.....	115-125	100-108	184-201	51.0-56.0	167-183
17	.....	.....	126-136	109-118	202-220	56.1-61.2	184-201

Source: Table 36 (p.119) in R.J. List (1951):Smithsonian Meteorological Tables:Smithsonian Miscell.Coll.Vol. 114.

Table VIII demonstrates the diurnal variation of various recorded parameters. Hourly averages are determined by arithmetically averaging five-minute samples, except for wind direction averages which are computed vectorially assuming unit vector magnitudes. Totals in the diurnal wind direction tables are vector averages of the columns and rows. For all parameters, a blank entry in the diurnal variation table indicates that less than half (i.e., less than 6) of the five-minute samples for that hour are present.

All times given in the data presentation are Mountain Standard Time.

To facilitate comparison of recorded concentrations to ambient air quality standards, the following regulations are presented.

TABLE II
FEDERAL AND COLORADO STANDARDS

	<u>Primary</u>	<u>Secondary</u>	<u>Non-Designated Area</u>	<u>1973</u>	<u>Designated Area</u>	
					<u>1976</u>	<u>1980</u>
<u>Particulate</u>						
Annual G. M.	75 $\mu\text{g}/\text{m}^3$	60 $\mu\text{g}/\text{m}^3$	45 $\mu\text{g}/\text{m}^3$	70 $\mu\text{g}/\text{m}^3$	55 $\mu\text{g}/\text{m}^3$	45 $\mu\text{g}/\text{m}^3$
24 Hr. Max.*	260	150	150	200	180	150
<u>Sulfur Oxides</u>						
Annual	80(.03ppm)		--	60(.02ppm)	25(.009ppm)	10(.004ppm)
24 Hr. Max.*	365(.14ppm)		15(.005ppm)	300(.1ppm)	150(.05ppm)	55(.02ppm)
3 Hr. Max.*	--	1300(.5ppm)	--	--	--	--
1 Hr. Max.**	--	--	--	800(.28ppm)	300(.1ppm)	--
<u>Oxidant</u>						
1 Hr. Max.*	160(.08ppm)	160				
8 Hr. Max.*	--	--				
Annual	--	--				
<u>Hydrocarbons</u>						
3 Hr. Max.*	160(.24ppm)	160				
6-9 a.m.						
<u>Carbon Monoxide</u>						
Max. 8 Hrs.*	10000(9ppm)	10000				
Max. 1 Hr.*	40000(35ppm)	40000				
<u>Nitrogen Dioxide</u>						
Annual	100(.05ppm)	100				

Units are micrograms per cubic meter and ppm in parenthesis.

*Not to be exceeded more than once per year.

**Not to be exceeded more than once per month.

TABLE III
AVERAGES FOR JULY 1 THRU 31

TABLE III. AVERAGES FOR JULY 1 THRU 31

UNIT: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITROGEN OXIDES(NOx)		NITRIC OXIDE(NO)		NITROGEN DIOXIDE(NO2)	
SITE	023	023	023	023	023
	.7	.1		.6	

SULFUR DIOXIDE(SO2)		PYRANOMETER		SULFUR DIOXIDE(SO2)	
SITE	023	023	023	023	023
	.1	14515.9		.8	

TOTAL HYDROCARBONS		METHANE		NON-METHANE HYDROCARBONS	
SITE	023	023	023	023	023
	1161.9	853.8		312.9	

CARBON MONOXIDE		OZONE		BAROMETRIC PRESSURE	
SITE	023	023	023	023	023
	205.2	89.2		794.2	

TOTAL PRECIPITATION		PARTICULATE	
SITE	023	023	023
	.00	11.5	

TABLE III. AVERAGES FOR JULY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

WIND SPEED

SITE 023	(0-FT)	(30-FT)	(100-FT)	(200-FT)
	4.1	5.5	6.3	7.2

WIND DIRECTION

SITE 023	(0-FT)	(30-FT)	(100-FT)	(200-FT)
213.6	205.9	204.2	213.8	

RELATIVE HUMIDITY

SITE 023	(0-FT)	(30-FT)	(100-FT)	(200-FT)
51.5				

TEMPERATURE

SITE 023	(0-FT)	(30-FT)	(100-FT)	(200-FT)
67.5	69.5	69.2		

TABLE IV
DAILY AVERAGES FOR JULY 1 THRU 31

PYRANOMETER-TOTAL LANGLEYS/ PRECIPITATION-INCHES)

NITROGEN OXIDES (NOx)

NITRIC OXIDE (NO)

NITROGEN DIOXIDE (NO2)

DATE 023

023

023

DATE

7/1	.2	.0	.2
7/2	.0	.0	.0
7/3	.0	.0	.0
7/4	.0	.0	.0
7/5	.0	.0	.0
7/6	.2	.0	.2
7/7	.0	.0	.0
7/8	.7	.0	.7
7/9	2.5	.0	2.5
7/10	.1	.1	.0
7/11	.0	.0	.0
7/12	.0	.0	.0
7/13	1.8	1.8	12.2
7/14	.0	.0	.0
7/15	.0	.0	.0
7/16	.0	.0	.0
7/17	.0	.0	.0
7/18	.0	.0	.0
7/19	.0	.0	.0
7/20	.0	.0	.0
7/21	.0	.0	.0
7/22	.0	.0	.0
7/23	.0	.0	.0
7/24	.0	.0	.0
7/25	.0	.0	.0
7/26	.3	.0	.3
7/27	.0	.0	.0
7/28	.1	.0	.1
7/29	.1	.0	.1
7/30	.1	.0	.1
7/31	.1	.1	.0

II B-1985

682.2

.8

II B-1986

TABLE IV. DAILY AVERAGES FOR JULY 1 THRU 31
UNITS: CONCENTRATIONS-PPM; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
BYPASS-FT; TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES

DATE	TOTAL HYDROCARBONS		METHANE		NON-METHANE HYDROCARBONS	
	W23	W23	W23	W23	W23	W23
7/1	1116.1	843.9			272.2	
7/2	1169.6	838.3			267.5	
7/3	1132.7	834.6			298.1	
7/4	1111.7	812.7			299.0	
7/5	1094.3	822.3			272.0	
7/6	1080.7	824.6			264.1	
7/7	1138.3	826.4			311.9	
7/8	1145.1	820.0			285.1	
7/9	1100.0	852.4			253.6	
7/10	1113.0	870.6			242.4	
7/11	1107.0	850.1			257.5	
7/12	1103.6	797.9			305.2	
7/13	1150.8	812.4			338.4	
7/14	1269.7	868.0			401.7	
7/15		887.2				
7/16		934.1				
7/17		928.0				
7/18	1083.7	928.5			133.3	
7/19	1083.3	933.7			149.6	
7/20						
7/21						
7/22						
7/23	1212.7	871.9			330.7	
7/24	1103.3	875.6			322.7	
7/25	1192.5	876.2			316.3	
7/26	1290.3	887.8			332.6	
7/27	1210.8	835.0			381.0	
7/28	1240.3	832.7			413.6	
7/29	1173.5	826.9			348.6	
7/30	1193.4	814.1			369.3	
7/31	1200.4	875.2			325.2	

TABLE IV. DAILY AVERAGES FOR JULY 1 THRU 31

(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

CARBON DIOXIDE

OZONE

BAROMETRIC PRESSURE

DATE	STF	MP3	023	023	023
7/1	230.8	70.0	792.6		
7/2	234.5	90.7	791.5		
7/3	230.3	85.3	791.2		
7/4	229.5	76.3	791.5		
7/5	220.2	77.3	794.0		
7/6	209.8	85.6	794.7		
7/7	233.6	80.1	793.9		
7/8	234.0	79.7	793.4		
7/9	200.0	85.4	792.3		
7/10	192.7	99.8	791.3		
7/11	237.6	102.0	792.3		
7/12	250.1	89.3	792.2		
7/13	207.8	92.2	792.4		
7/14	302.6	101.5	794.2		
7/15	413.4	103.4	795.2		
7/16	552.0	101.9	795.5		
7/17	430.6	97.4	794.5		
7/18	335.5	102.3	792.6		
7/19	343.9	94.6	792.4		
7/20					
7/21					
7/22					
7/23	260.9	99.1	796.6		
7/24	276.0	80.4	795.7		
7/25	285.2	72.7	797.1		
7/26	234.3	80.2	797.4		
7/27	204.9	74.7	797.6		
7/28	211.1	82.1	797.1		
7/29	197.0	89.6	795.8		
7/30	130.7	89.2	795.1		
7/31	139.4	90.3	797.1		

TABLE IV. DAILY AVERAGES FOR JULY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TOTAL PRECIPITATION		PARTICULATE	
DATE	SITE 023	023	
7/1		33.0	
7/2		21.0	
7/3		14.0	
7/4	.03	13.0	
7/5		13.0	
7/6	.14	11.0	
7/7		16.0	
7/8		21.0	
7/9		11.0	
7/10		19.0	
7/11		7.0	
7/12		9.0	
7/13		9.0	
7/14		16.0	
7/15		18.0	
7/16		19.0	
7/17		16.0	
7/18	.02	8.0	
7/19	.01		
7/20		8.0	
7/21		3.0	
7/22			
7/23	.06		
7/24	.10		
7/25		2.0	
7/26		11.0	
7/27		9.0	
7/28		5.0	
7/29	.15	20.0	
7/30		15.0	
7/31			

TABLE IV. DAILY AVERAGE FOR JULY 1 THRU 31

(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

WIND SPEED

DATE	(0-FT)	(32-FT)	(100-FT)	(200-FT)
7/1	4.6	6.1	6.5	6.9
7/2	5.0	6.6	7.6	8.7
7/3	2.6	3.7	3.9	4.2
7/4	5.9	8.2	9.7	10.6
7/5	4.4	6.0	7.2	8.3
7/6	1.3	2.0	2.6	3.1
7/7	2.5	3.4	3.3	3.2
7/8	3.4	4.4	4.5	4.8
7/9	7.6	10.5	12.7	14.4
7/10	0.6	11.5	13.6	15.5
7/11	4.7	6.0	7.0	8.1
7/12	0.1	7.9	9.5	10.6
7/13	1.2	13.4	15.5	17.4
7/14	2.8	4.2	5.4	6.2
7/15	1.9	2.6	2.5	2.6
7/16	1.8	2.5	3.1	3.2
7/17	7	9	7	1.3
7/18	4.0	5.8	7.1	8.2
7/19	0.2	7.1	8.8	10.7
7/20				
7/21				
7/22				
7/23				
7/24				
7/25				
7/26				
7/27				
7/28				
7/29				
7/30				
7/31				

TABLE IV. DAILY AVERAGES FOR JULY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PSYCHROMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

WIND DIRECTION

DATE	SITE 023 (0-FT)	(30-FT)	(100-FT)	(200-FT)
7/1	222.7	210.3	215.1	223.4
7/2	231.0	224.5	224.2	231.8
7/3	250.7	254.1	260.1	271.9
7/4	245.6	199.0	198.4	206.5
7/5	189.4	149.0	140.0	197.6
7/6	180.4	182.5	174.8	196.9
7/7	232.8	222.1	225.3	237.2
7/8	226.2	219.4	223.8	236.1
7/9	209.0	200.4	197.2	205.9
7/10	224.2	210.5	210.8	228.1
7/11	227.0	220.0	220.6	230.7
7/12	212.2	205.1	205.5	214.7
7/13	190.0	144.1	183.5	192.5
7/14	160.2	150.3	149.1	157.0
7/15	203.2	240.8	240.3	252.2
7/16	155.5	142.0	139.3	165.1
7/17	250.7	240.3	249.8	254.7
7/18	229.9	220.6	210.4	225.7
7/19	107.8	190.5	190.2	201.5
7/20				
7/21				
7/22				
7/23				
7/24				
7/25				
7/26				
7/27				
7/28				
7/29				
7/30				
7/31				

TABLE IV. DAILY AVERAGES FOR JULY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TEMPERATURE

DATE	SITE 023			TEMPERATURE	
	(0-FT)	(30-FT)	(100-FT)	(200-FT)	
7/1	60.0	69.7	68.7		
7/2	60.6	70.2	68.9		
7/3	60.0	69.0	68.0		
7/4	62.0	62.7	62.2		
7/5	61.6	62.1	61.7		
7/6	60.0	65.5	65.5		
7/7	67.2	68.5	68.4		
7/8	69.0	70.8	70.1		
7/9	71.8	72.3	71.4		
7/10	70.5	71.4	70.6		
7/11	69.3	69.7	71.1	72.3	
7/12	71.9	73.0	74.0	68.1	
7/13	70.0	70.1	69.4	69.8	
7/14	71.5	71.6	71.2	71.9	
7/15	71.4	73.0	72.9	73.0	
7/16	72.1	74.1	74.1	70.9	
7/17	70.7	72.1	71.9	68.3	
7/18	59.0	69.9	69.2		
7/19					
7/20					
7/21					
7/22					
7/23	63.0				
7/24	63.0				
7/25	65.0				
7/26	60.6				
7/27	64.8				
7/28	60.4				
7/29	60.6				
7/30	69.3				
7/31	60.0				

TABLE IV. DAILY AVERAGES FOR JULY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FARENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LARGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

RELATIVE HUMIDITY

DATE	SITE 423		RELATIVE HUMIDITY	
	(0-FT)	(30-FT)	(100-FT)	(200-FT)
7/1				
7/2	33.6			
7/3	31.5			
7/4	55.0			
7/5	53.7			
7/6	37.3			
7/7	24.2			
7/8	19.9			
7/9	14.8			
7/10	13.1			
7/11	19.3			
7/12	19.4			
7/13	33.4			
7/14	29.0			
7/15	23.7			
7/16	27.8			
7/17	32.5			
7/18	43.3			
7/19				
7/20				
7/21				
7/22				
7/23				
7/24				
7/25				
7/26				
7/27				
7/28				
7/29				
7/30				
7/31				

TABLE V
MAXIMUM FIVE-MINUTE AVERAGES AND TIME
OF OCCURRENCE FOR JULY 1 THRU 31

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THRU 31
 (UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
 TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
 PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITROGEN OXIDES(NOX)

DATE SITE 123

7/1 40.9(11:45)
 7/2 .0(0:00)
 7/3 .0(0:00)
 7/4 .0(0:00)
 7/5 .0(0:00)
 7/6 35.3(15:25)
 7/7 .0(0:00)
 7/8 52.4(15:40)
 7/9 104.9(5:10)
 7/10 10.7(9:10)
 7/11 .0(0:10)
 7/12 .0(0:40)
 7/13 240.0(11:55)
 7/14 .0(0:00)
 7/15 .0(0:00)
 7/16 .0(0:10)
 7/17 .0(0:00)
 7/18 .0(0:00)
 7/19 .0(0:00)
 7/20 .0(0:00)

7/21
 7/22 .0(13:25)
 7/23 .0(0:00)
 7/24 .0(0:00)
 7/25 .0(0:00)
 7/26 5.7(17:40)
 7/27 1.9(17:10)
 7/28 1.9(11:40)
 7/29 1.9(2:25)
 7/30 1.9(1:25)
 7/31 1.9(3:00)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THRU 31
(UNIT: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITRIC OXIDE(NO)

DATE	SITE	NO
7/1		.0(8:35)
7/2		.0(8:00)
7/3		.0(8:00)
7/4		.0(8:00)
7/5		.0(8:00)
7/6		.0(8:05)
7/7		.0(8:00)
7/8		.0(8:00)
7/9		.0(8:50)
7/10	13	.7(8:00)
7/11		.0(8:10)
7/12		.0(8:00)
7/13	12	.1(11:55)
7/14		.0(8:00)
7/15		.0(8:00)
7/16		.0(8:00)
7/17		.0(8:00)
7/18		.0(8:00)
7/19		.0(8:00)
7/20		.0(8:00)
7/21		.0(13:25)
7/22		.0(8:00)
7/23		.0(8:00)
7/24		.0(8:00)
7/25		.0(8:00)
7/26		.0(8:00)
7/27		1.9(17:10)
7/28		.0(8:00)
7/29		.0(8:00)
7/30		.0(8:05)
7/31		1.9(12:05)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THRU 31
 (UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
 TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
 PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITROGEN DIOXIDE (NO2)

DATE	TIME	NO2
7/1	44.9(11:45)	
7/2	.0(0:00)	
7/3	.0(0:00)	
7/4	.0(0:00)	
7/5	.0(0:00)	
7/6	39.3(15:25)	
7/7	.0(0:00)	
7/8	52.4(16:40)	
7/9	104.3(5:10)	
7/10	.0(0:00)	
7/11	.0(0:00)	
7/12	.0(0:00)	
7/13	160.5(11:20)	
7/14	.0(0:00)	
7/15	.0(0:00)	
7/16	.0(0:00)	
7/17	.0(0:00)	
7/18	.0(0:00)	
7/19	.0(0:00)	
7/20		
7/21		
7/22	.0(13:25)	
7/23	.0(0:00)	
7/24	.0(0:00)	
7/25	.0(0:00)	
7/26	5.7(17:40)	
7/27	.0(0:00)	
7/28	1.9(11:40)	
7/29	1.0(2:25)	
7/30	1.0(1:25)	
7/31	1.9(3:00)	

TABLE V. MAY 1944 FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

SULFUR DIOXIDE (SO2)

SITE 123

DATE

7/1	.0 (0:00)
7/2	.0 (0:00)
7/3	.0 (0:00)
7/4	.0 (0:00)
7/5	2.6 (14:30)
7/6	2.6 (0:15)
7/7	2.6 (0:25)
7/8	2.6 (0:55)
7/9	2.5 (1:00)
7/10	2.5 (0:20)
7/11	2.5 (0:20)
7/12	2.5 (0:25)
7/13	2.3 (0:55)
7/14	.0 (0:00)
7/15	.0 (0:00)
7/16	.0 (0:00)
7/17	.0 (0:00)
7/18	2.8 (12:45)
7/19	.0 (0:00)
7/20	
7/21	
7/22	.0 (13:25)
7/23	.0 (0:00)
7/24	.0 (0:00)
7/25	.0 (0:00)
7/26	.0 (0:00)
7/27	.0 (0:00)
7/28	2.6 (11:40)
7/29	1.2 (12:50)
7/30	.0 (0:00)
7/31	.0 (0:00)

WIND DIRECTION-DEGREES; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

PYRANOMETER

DATE	SIZE	423
7/1	8.75(11:30)	
7/2	8.25(13:55)	
7/3	6.50(12:40)	
7/4	7.05(13:30)	
7/5	7.90(12:10)	
7/6	7.00(13:20)	
7/7	8.10(13:30)	
7/8	8.25(12:05)	
7/9	7.60(12:05)	
7/10	7.10(11:45)	
7/11	7.25(11:30)	
7/12	7.30(12:35)	
7/13	7.55(12:40)	
7/14	8.15(12:45)	
7/15	7.35(11:35)	
7/16	7.00(12:30)	
7/17	6.75(14:50)	
7/18	3.35(10:45)	
7/19	8.50(12:15)	
7/20		
7/21	7.25(14:00)	
7/22	7.70(14:20)	
7/23	3.50(11:30)	
7/24	7.10(10:50)	
7/25	7.25(12:45)	
7/26	6.75(13:35)	
7/27	7.20(12:30)	
7/28	7.10(12:25)	
7/29	7.15(12:25)	
7/30	7.00(12:10)	

MIN FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THROUGH
CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PRECIPITATION-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

SULFUR DIOXIDE (SO2)

STATION 423

DATE

7/1 2.6(9:50)
7/2 2.6(0:15)
7/3 5.2(6:20)
7/4 2.6(0:15)
7/5 5.2(15:55)
7/6 2.6(0:35)
7/7 5.2(17:20)
7/8 10.4(9:45)
7/9 10.4(4:10)
7/10 10.4(3:25)
7/11 10.4(0:50)
7/12 10.4(4:25)
7/13 15.6(8:55)
7/14 0.0(0:00)
7/15 2.6(2:15)
7/16 7.8(12:15)
7/17 2.6(2:55)
7/18 0.0(0:00)
7/19 0.0(0:10)
7/20

7/21 0.0(14:10)
7/22 31.3(13:50)
7/23 0.0(0:00)
7/24 0.0(0:00)
7/25 5.2(10:55)
7/26 5.2(12:25)
7/27 5.2(15:40)
7/28 20.0(12:30)
7/29 0.0(0:05)
7/30 20.0(9:20)
7/31

REPORT

1434 FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THRU 31
 CORPORATION
 (UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
 TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
 PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TOTAL HYDROCARBONS

DATE	SITE	623
7/1	1289.5	(7:34)
7/2	2364.3	(5:25)
7/3	1183.3	(8:25)
7/4	1294.6	(16:55)
7/5	3517.8	(4:15)
7/6	1180.2	(8:45)
7/7	1239.3	(13:29)
7/8	1220.3	(3:24)
7/9	1142.3	(8:40)
7/10	1157.9	(23:47)
7/11	1247.4	(2:40)
7/12	1197.6	(7:13)
7/13	2815.5	(21:45)
7/14	3122.6	(12:30)
7/15	1553.3	(21:25)
7/16	2545.2	(22:24)
7/17	2121.7	(13:45)
7/18	1413.0	(13:50)
7/19	3241.3	(6:55)
7/20		
7/21		
7/22	1183.3	(22:40)
7/23	1251.4	(15:50)
7/24	1543.3	(2:10)
7/25	1239.6	(11:45)
7/26	2543.7	(17:55)
7/27	2637.5	(1:50)
7/28	1323.3	(7:40)
7/29	1315.9	(8:45)
7/30	1291.4	(9:45)
7/31	1325.0	(9:35)

1400 FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THROUGH 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

METHANE

SITE 023

DATE

7/1 893.10 2:45)
7/2 854.40 3:35)
7/3 872.00 2:15)
7/4 831.60 0:10)
7/5 862.20 6:00)
7/6 840.10 15:40)
7/7 877.90 3:05)
7/8 855.50 19:25)
7/9 877.90 17:55)
7/10 903.30 23:55)

7/11 933.90 1:10)
7/12 820.50 7:45)
7/13 837.60 22:55)
7/14 933.90 1:00)
7/15 933.90 21:45)
7/16 2464.00 6:40)
7/17 2292.30 5:45)
7/18 1940.00 8:30)
7/19 955.40 12:35)
7/20

7/21
7/22 1070.80 14:55)
7/23 933.90 5:55)
7/24 1223.00 14:05)
7/25 1113.30 3:30)
7/26 1217.10 15:35)
7/27 852.20 20:25)
7/28 852.20 14:35)
7/29 1145.50 16:30)
7/30 843.10 9:15)
7/31 937.10 4:50)

14.14 FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NON-METHANE HYDROCARBONS

SITE 023

DATE

7/1 426.0 (7:30)
7/2 2129.9 (5:25)
7/3 343.5 (0:25)
7/4 433.4 (16:55)
7/5 2246.3 (4:15)
7/6 567.9 (8:45)
7/7 415.5 (13:00)
7/8 429.8 (3:20)
7/9 334.1 (0:40)
7/10 283.3 (22:55)

7/11 325.0 (23:55)
7/12 383.1 (7:15)
7/13 1956.2 (21:45)
7/14 2259.4 (12:30)
7/15 627.8 (21:25)
7/16 1144.9 (22:20)
7/17 1242.2 (10:05)
7/18 232.5 (10:20)
7/19 2695.9 (6:55)
7/20

7/21
7/22 713.7 (13:20)
7/23 307.2 (15:50)
7/24 773.4 (2:10)
7/25 422.0 (11:45)
7/26 1586.0 (17:55)
7/27 1739.5 (1:50)
7/28 600.4 (7:10)
7/29 450.1 (8:50)
7/30 430.3 (10:00)

7/31 832.0 (9:20)

IN FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THROUGH 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

CARBON MONOXIDE

SITE 023

DATE

7/1 470.4 (8:45)
7/2 445.6 (12:40)
7/3 250.7 (15:25)
7/4 457.3 (17:45)
7/5 300.6 (1:50)
7/6 272.4 (5:30)
7/7 237.0 (2:00)
7/8 207.3 (19:30)
7/9 243.8 (20:35)
7/10 225.7 (4:25)

7/11 312.3 (14:35)
7/12 285.5 (5:55)
7/13 331.0 (23:15)
7/14 301.4 (2:40)
7/15 3259.4 (12:50)
7/16 1860.7 (0:10)
7/17 687.2 (2:00)
7/18 910.3 (4:50)
7/19 482.1 (6:25)
7/20

7/21
7/22 550.9 (14:30)
7/23 1530.5 (13:50)
7/24 210.6 (15:55)
7/25 1520.7 (0:10)
7/26 1030.3 (11:40)
7/27 207.4 (14:15)
7/28 247.3 (0:45)
7/29 233.5 (8:30)
7/30 233.0 (3:35)

7/31 1373.3 (16:25)

FROM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THRU 31
 TEMPERATURES-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
 TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
 PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

OZONE

SITE 423

DATE

7/1 59.6 (8:45)
 7/2 115.3 (16:50)
 7/3 121.6 (9:55)
 7/4 65.7 (8:52)
 7/5 93.5 (17:20)
 7/6 127.5 (0:25)
 7/7 93.8 (12:45)
 7/8 93.8 (16:40)
 7/9 101.5 (15:20)
 7/10 117.2 (18:55)

7/11 117.2 (9:55)
 7/12 103.3 (10:10)
 7/13 115.3 (18:05)
 7/14 115.2 (15:10)
 7/15 125.0 (15:20)
 7/16 121.1 (17:40)
 7/17 115.3 (14:40)
 7/18 114.2 (20:15)
 7/19 121.1 (12:40)
 7/20

7/21 132.9 (15:40)
 7/22 500.2 (13:50)
 7/23 115.3 (11:52)
 7/24 445.3 (8:10)
 7/25 121.5 (9:53)
 7/26 27.9 (12:45)
 7/27 107.3 (9:45)
 7/28 109.4 (12:45)
 7/29 127.4 (18:40)
 7/30 445.0 (8:25)
 7/31

MAXIMUM FIVE MINUTE AVERAGE AND TIME OF OCCURRENCE FOR JULY 1 THRU 1
 (UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
 TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
 PYROMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

BAROMETRIC PRESSURE

STATION 023

DATE

7/1 794.0 (5:30)
 7/2 794.0 (3:40)
 7/3 795.0 (6:00)
 7/4 792.0 (6:35)
 7/5 795.0 (7:40)
 7/6 795.0 (6:10)
 7/7 795.0 (2:00)
 7/8 795.0 (5:05)
 7/9 794.0 (5:55)
 7/10 795.0 (21:55)

7/11 794.0 (7:55)
 7/12 794.0 (6:30)
 7/13 794.0 (12:30)
 7/14 795.0 (6:30)
 7/15 797.0 (7:35)
 7/16 796.0 (8:05)
 7/17 795.0 (2:05)
 7/18 794.0 (2:00)
 7/19 795.0 (0:30)
 7/20

7/21 794.0 (13:20)
 7/22 794.0 (0:10)
 7/23 797.0 (21:30)
 7/24 795.0 (5:20)
 7/25 795.0 (7:00)
 7/26 794.0 (10:10)
 7/27 794.0 (8:00)
 7/28 797.0 (2:10)
 7/29 797.0 (23:15)
 7/30

7/31 794.0 (5:00)

LESLIE
CORPORATION

FROM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THRU 31
UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TOTAL PRECIPITATION

DATE TIME

023

7/1
7/2
7/3
7/4
7/5
7/6
7/7
7/8
7/9
7/10

.01 (19:25)

.02 (10:55)

7/11
7/12
7/13
7/14
7/15
7/16
7/17
7/18
7/19
7/20

.01 (23:45)
.50 (12:35)

7/21
7/22
7/23
7/24
7/25
7/26
7/27
7/28
7/29
7/30

.11 (9:40)
.00 (20:40)

.03 (22:50)

7/31

MAXIMUM FIVE MINUTE AVERAGE AND TIME OF OCCURRENCE FOR JULY 1 THROUGH JULY 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

WIND SPEED WIND DIRECTION

SLIP 023

DATE	(0-FT)	(30-FT)	(100-FT)	(200-FT)
7/1	27.0	216.0(16:05)	41.0	212.0(16:05)
7/2	26.0	301.0(13:40)	33.0	286.0(13:40)
7/3	17.0	172.0(15:55)	26.0	168.0(15:55)
7/4	18.0	200.0(15:00)	24.0	180.0(14:45)
7/5	20.0	310.0(17:30)	29.0	297.0(17:30)
7/6	20.0	200.0(0:10)	31.0	200.0(0:10)
7/7	17.0	258.0(14:15)	23.0	249.0(14:15)
7/8	16.0	262.0(14:50)	21.0	216.0(15:20)
7/9	22.0	226.0(16:20)	31.0	217.0(16:20)
7/10	20.0	256.0(12:50)	29.0	214.0(12:15)
7/11	17.0	226.0(11:35)	23.0	210.0(11:35)
7/12	16.0	206.0(9:55)	21.0	212.0(11:05)
7/13	22.0	188.0(6:35)	30.0	180.0(6:35)
7/14	15.0	52.0(13:20)	21.0	48.0(13:20)
7/15	21.0	312.0(12:05)	31.0	303.0(12:05)
7/16	16.0	154.0(12:15)	17.0	144.0(12:15)
7/17	16.0	182.0(18:15)	27.0	176.0(18:15)
7/18	16.0	230.0(11:30)	21.0	218.0(19:30)
7/19	16.0	178.0(1:20)	23.0	170.0(1:20)
7/20				
7/21				
7/22				
7/23				
7/24				
7/25				
7/26				
7/27				
7/28				
7/29				
7/30				
7/31				

BRANDEN
CORPORATION

11M J M FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TEMPERATURE

DATE	SITE 024 (3-FT)	(30-FT)	(120-FT)	(200-FT)
7/1	85.0(12:45)	83.0(14:10)	80.0(14:10)	
7/2	83.0(16:05)	82.0(13:35)	79.0(16:00)	
7/3	85.0(14:10)	82.0(14:15)	79.0(14:15)	
7/4	71.0(13:35)	68.0(13:25)	67.0(2:15)	
7/5	75.0(11:35)	73.0(12:40)	72.0(12:25)	
7/6	79.0(16:40)	77.0(17:10)	76.0(17:10)	
7/7	85.0(15:20)	83.0(15:15)	79.0(15:10)	
7/8	81.0(11:50)	85.0(14:25)	81.0(14:25)	
7/9	80.0(14:45)	83.0(14:50)	79.0(14:45)	
7/10	84.0(14:20)	82.0(15:30)	79.0(15:25)	
7/11	84.0(12:30)	82.0(13:30)	83.0(9:25)	78.0(14:35)
7/12	87.0(16:45)	84.0(14:30)	83.0(14:30)	80.0(14:30)
7/13	82.0(15:50)	79.0(14:40)	77.0(14:40)	77.0(14:50)
7/14	83.0(10:50)	81.0(12:45)	80.0(12:50)	78.0(12:50)
7/15	85.0(11:40)	84.0(15:20)	92.0(16:20)	80.0(17:15)
7/16	85.0(14:15)	84.0(15:40)	82.0(15:40)	80.0(17:45)
7/17	84.0(11:25)	83.0(10:10)	81.0(10:10)	78.0(10:00)
7/18	87.0(13:00)	81.0(12:20)	78.0(12:20)	76.0(12:25)
7/19	77.0(12:15)	75.0(11:50)	73.0(12:15)	71.0(11:45)
7/20				
7/21				
7/22	77.0(16:00)			
7/23	75.0(16:00)			
7/24	77.0(14:00)			
7/25	79.0(16:35)			
7/26	83.0(13:45)			
7/27	79.0(8:55)			
7/28	82.0(14:00)			
7/29	85.0(12:30)			
7/30	86.0(13:20)			
7/31	82.0(16:00)			

INJULY FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JULY 1 THRU 31
 (UNIT 5) CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
 TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
 PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

RELATIVE HUMIDITY

DATE	SITE 125 (0-FT)	(30-FT)	(100-FT)	(200-FT)
7/1	42.0(20:40)			
7/2	62.0(4:30)			
7/3	50.0(5:15)			
7/4	44.0(20:30)			
7/5	45.0(0:35)			
7/6	65.0(4:45)			
7/7	45.0(4:45)			
7/8	36.0(4:00)			
7/9	29.0(5:10)			
7/10	25.0(23:25)			
7/11	31.0(4:15)			
7/12	26.0(0:00)			
7/13	40.0(9:25)			
7/14	49.2(5:00)			
7/15	30.0(5:30)			
7/16	42.0(4:50)			
7/17	62.0(18:15)			
7/18	46.0(23:50)			
7/19	48.0(2:15)			
7/20				
7/21				
7/22				
7/23				
7/24				
7/25				
7/26				
7/27				
7/28				
7/29				
7/30				
7/31				

TABLE VI
THE FIVE MAXIMUM INDEPENDENT SLIDING
AVERAGES FOR JULY 1 THRU 31

TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUL 1-31
(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)

UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

NITROGEN OXIDES[WS: WD]
1-HOUR

SITE	023
1. 7/13(11:30-12:30)	169.3(18:183)
2. 7/9(4:45-5:45)	25.7(5:83)
3. 7/9(6:30-7:30)	12.8(5:74)
4. 7/8(15:45-16:45)	8.3(13:224)
5. 7/9(8:30-9:30)	6.9(10:140)

NITRIC OXIDE[WS: WD]
1-HOUR

SITE	023
1. 7/13(11:30-12:30)	32.9(14:1183)
2. 7/13(3:55-4:55)	1.6(17:213)
3. 7/31(11:45-12:45)	.6(1:1)
4. 7/31(15:45-16:45)	.6(1:1)
5. 7/31(13:30-14:30)	.5(1:1)

NITROGEN DIOXIDE[WS: WD]
1-HOUR

SITE	023
1. 7/13(11:30-12:30)	136.2(14:143)
2. 7/9(4:45-5:45)	25.7(5:83)
3. 7/9(6:30-7:30)	12.8(5:74)
4. 7/8(15:45-16:45)	8.3(13:224)
5. 7/9(8:30-9:30)	6.9(10:140)

TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUL 1-31

(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)

UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

SULFUR DIOXIDE[WS: WD]
1-HOUR

SITE 23

1. 7/20 9:50-10:50	2.0	1
2. 7/13 8:50-9:50	1.7	153
3. 7/13 11:30-12:30	1.7	9:226
4. 7/16 4:10-5:10	1.3	13:231
5. 7/5 14:20-15:25	1.1	12:234

SULFUR DIOXIDE[WS: WD]
3-HOUR

SITE 23

1. 7/19 4:10-7:10	.9	11:237
2. 7/18 11:40-12:40	.9	9:313
3. 7/13 0:40-11:40	.8	16:165
4. 7/11 1:50-4:50	.8	2:166
5. 7/29 5:30-12:35	.7	1

SULFUR DIOXIDE[WS: WD]
24-HOUR

SITE 23

1. 7/10 7:11 0:00	.3	6:214
2. 7/12 7:13 16:00	.3	14:130
3. 7/23 7:29 11:00	.3	1
4. 7/5 7/5 14:31	.2	0:142
5. 7/6 7/7 17:31	.2	7:236

TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUL 1-31

(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)

UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

SULFUR DIOXIDE(MS: WD)
1-HOUR

SITE 123

1.	7/11C	8:30-	9:30	17.40	?	1
2.	7/11C	5:00-	4:30	9.60	21192	
3.	7/11C	5:50-	5:50	9.50	3: 74	
4.	7/11C	1:35-	2:35	9.30	11: 72	
5.	7/11C	3:10-	4:10	8.50	11:198	

TOTAL HYDROCARBONS(MS: WD)
3-HOUR(6-9AM)

SITE 023

1.	7/29C	6:40-	9:30	1280.30	?	1
2.	7/29C	8:30-	9:30	1247.00	?	1
3.	7/31C	6:40-	9:30	1237.80	?	1
4.	7/25C	6:40-	9:30	1226.60	?	1
5.	7/23C	6:40-	9:30	1211.20	?	1

PRIMARY STANDARD EXCEEDED 20 TIMES AT SITE 023

SECONDARY STANDARD EXCEEDED 20 TIMES AT SITE 023

TABLE VI. THE FIVE MAXIMUM AVERAGES FOR JUL 1-31

(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)

UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

METHANOLMS: MDI
3-HOUR (6-9AM)

SITE 423

1. 7/15(6:00- 9:00) 995.91 5:1581
2. 7/19(6:00- 9:00) 931.11 9:1591
3. 7/17(6:00- 9:00) 917.61 3: 351
4. 7/31(5:00- 9:00) 901.01 3: 1
5. 7/15(6:00- 9:00) 891.31 3: 461

PRIMARY STANDARD EXCEEDED 23 TIMES AT SITE 023

SECONDARY STANDARD EXCEEDED 23 TIMES AT SITE 023

TABLE VI. THE FIVE MAXIMUM AVERAGES FOR JUL 1-31
(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

NON-METHANE HYDROCARBONS (WS: WD)
3-HOUR (6-9 AM)

SITE 023

1.	7/29(	5:30-	9:00)	441.20	:	1
2.	7/29(	6:00-	9:00)	421.50	:	1
3.	7/29(	6:00-	9:00)	356.20	:	1
4.	7/30(	5:00-	9:00)	345.40	:	1
5.	7/31(	5:00-	9:00)	336.01	:	1

PRIMARY STANDARD EXCEEDED 24 TIMES AT SITE 023
SECONDARY STANDARD EXCEEDED 24 TIMES AT SITE 023

TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUL 1-31
(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

CARBON MONOXIDE(MS; MD)
1-HOUR

SITE	023	.
1. 7/14(2:35- 3:35) 741.2(0:1581		
2. 7/16(13:15-14:15) 646.4(4:136)		
3. 7/16(14:25-15:25) 511.2(0:132)		
4. 7/16(12:45-13:45) 604.1(11:307)		
5. 7/16(8:15- 9:15) 592.7(8:1211)		

TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUL 1-31
(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)

UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

CARBON MONOXIDE(WS: WD)
8-HOUR

SITE	023
1. 7/15(12:55-20:55)	573.0(4:121)
2. 7/16(1:55- 9:55)	553.4(5:121)
3. 7/16(21:55- 5:55)	520.9(3:169)
4. 7/17(5:55-14:55)	489.5(7:325)
5. 7/17(23:55- 7:55)	471.9(6:182)

TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUL 1-31
 (% WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
 UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
 WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

OZONE(MS: WD)
 1-HOUR

023

SITE

1.	7/23(13:40-14:45)	147.81	:	1
2.	7/31(7:30-8:30)	144.71	:	1
3.	7/31(5:20-6:20)	143.81	:	1
4.	7/22(15:00-16:00)	130.40	:	1
5.	7/23(15:50-16:50)	128.00	:	1

TABLE VI, THE FIVE MAXIMUM AVERAGES FOR JUL 1-31
UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER

PARTICULATE
24-HOUR

323

SIZE

1	7/1	33.0
2	7/2	21.0
3	7/8	21.0
4	7/25	20.0
5	7/10	19.0

TABLE VII
FUNCTIONAL DEPENDENCE OF RECORDED
PARAMETERS UPON WIND DIRECTION

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

ATLANTIC COAST (NO. 4) TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77) C-8 SHALE OIL PROJECT

WIND DIRECTION

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
CONCENTRATION																		
05/0000									6	2								8
57 100 :									4	1								5
100 - 100 :									2	0								2
120 - 120 :							1		0	0								1
140 - 140 :						1	0	1	0	0								3
160 - 160 :				0	0	0	0	1	1	0								2
180 - 180 :				1	1	1	1	0	0	1								4
200 - 200 :				0	0	0	0	0	1	0								1
220 - 220 :				0	0	1	1	0	1	0								3
240 - 240 :						0	0	3	1	0	1							7
260 - 260 :				1	0	1	0	1	0	2	2							7
280 - 280 :				0	1	0	0	0	1	0	0							3
300 - 300 :				0	1	0	0	0	1	0	0							1
320 - 320 :				0	0	0	0	1	1	0	1	1						6
340 - 340 :				0	0	1	0	0	1	1	0	0						6
360 - 360 :				0	0	0	0	0	1	1	0	0						1
LI 100 :	152	92	101	118	194	176	233	381	564	1045	721	290	239	214	166	132	16	4834
TOTAL :	152	93	103	123	198	182	236	388	583	1052	725	291	239	214	166	132	16	4892
MEAN	0.	0.	0.	1.	1.	2.	1.	1.	4.	0.	0.	0.	0.	0.	0.	0.	0.	0.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

ATOMIC OXIDE (NO)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

WIND DIRECTION

	LT	93	103	122	198	182	236	388	574	1049	725	291	239	214	166	132	15	4880
CONCENTRATION																		
06/8**3																		
GT 100 :																		
140 - 160 :																		
120 - 140 :																		
110 - 120 :																		
100 - 110 :									1									1
90 - 100 :									0									0
80 - 90 :									0	1								1
70 - 80 :									1	0								1
60 - 70 :									0	0								0
50 - 60 :									1	0								1
40 - 50 :									0	0								0
30 - 40 :									0	1								1
20 - 30 :									2	1								3
10 - 20 :									4	1								5
LT 10 :	152	93	103	122	198	182	236	388	574	1049	725	291	239	214	166	132	15	4880
TOTAL :	152	93	103	122	198	182	236	388	583	1053	725	291	239	214	166	132	15	4893
MEAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

THROUGH DIRECTION (H32) TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77) C-8 SHALE OIL PROJECT

WIND DIRECTION

CONCENTRATION																		
03/04/85																		
GR 100 :																		
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
140 - 160 :									3								1	3
120 - 140 :									4								1	4
110 - 120 :							1		3	2							1	5
100 - 110 :					1	1	0	1	1	0							1	3
90 - 100 :					0	0	0	1	1	0							1	4
80 - 90 :					1	1	1	0	0	1							1	2
70 - 80 :					0	0	0	0	1	0							1	4
60 - 70 :					0	1	1	0	1	0							1	3
50 - 60 :		1		1	0	0	0	3	1	0	1						1	7
40 - 50 :		0		1	0	1	0	1	0	2	2						1	7
30 - 40 :		0	1	0	1	0	0	0	1	0	0						1	3
20 - 30 :		0	1	0	0	1	0	1	1	0	1	1					1	6
10 - 20 :		0	0	2	1	1	0	0	1	0	0	0					1	5
LI 10 :	152	92	101	118	194	176	233	381	564	1046	721	290	239	214	166	132	16	4835
TOTAL :	152	93	100	122	198	182	236	368	583	1052	725	291	239	214	166	132	16	4892
.....																		
MEAN	0.	0.	0.	1.	1.	2.	1.	1.	4.	0.	0.	0.	0.	0.	0.	0.	0.	0.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE(SO2)

C-8 SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

WIND DIRECTION

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
CONCENTRATION																		
05/1143																		
GT 100 :																		
134 - 144 :																		
124 - 134 :																		
114 - 124 :																		
104 - 114 :																		
94 - 104 :																		
84 - 94 :																		
74 - 84 :																		
64 - 74 :																		
54 - 64 :																		
44 - 54 :																		
34 - 44 :																		
24 - 34 :																		
14 - 24 :																		
LT	10	163	96	111	137	231	217	268	446	634	1095	759	297	249	220	177	143	19 : 5262
TOTAL	:	163	96	111	137	231	217	268	446	635	1095	759	297	249	220	177	143	19 : 5263
MEAN	:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE(SO2) TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77) C-B SHALE OIL PROJECT

CONCENTRATION UG/M ³ OF		WIND DIRECTION																TOTAL	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		CALM
132 -	143 :																		:
122 -	134 :																		:
112 -	124 :																		:
102 -	113 :																		:
92 -	102 :																		:
82 -	92 :																		:
72 -	82 :																		:
62 -	72 :																		:
52 -	62 :																		:
42 -	52 :																		:
32 -	42 :																		:
22 -	32 :																		:
12 -	22 :	2	1	1	8	7	2	2	2	10	3	2					2	42	
LT	12 :	157	95	100	126	224	217	267	444	633	1085	756	295	249	220	177	143	17	5214
TOTAL	:	159	96	110	134	231	217	269	446	635	1095	759	297	249	220	177	143	19	5256
.....																			
MEAN	:	1.	2.	2.	2.	1.	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	2.	0.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

TOTAL HYDROCARBONS

TRAILER NO. - 23 PERIOD (7/1/77 TO 7/31/77) C-B SHALE OIL PROJECT

CONCENTRATION UG/M ³ GT 6100 :	0	SWP	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION				W	WNW	NW	NNW	CALM	TOTAL
									S	SSW	SW	WSW						
3600 - 3700 :																		:
3400 - 3500 :																		:
3200 - 3300 :			1															:
3000 - 3100 :			0				1						1					:
2800 - 2900 :			0		2		1		1				0					:
2600 - 2700 :			0		0		0		0				0					:
2400 - 2500 :			0		0		0		0				0					:
2200 - 2300 :			0		0		0		0				0					:
2000 - 2100 :	1	2	0	0	1	3	1	1	0	3	1		0	2	2	1		:
1800 - 1900 :	2	0	0	0	1	2	3	2	3	7	6	5	6	8	8	1	2	:
1600 - 1700 :	1	0	0	0	1	0	2	4	0	3	3	1	1	2	6	1	1	:
LT 1600 :	119	76	87	112	167	154	221	370	408	932	679	271	201	161	113	107	11	:
TOTAL :	123	78	87	113	169	159	229	379	502	945	689	277	209	173	129	110	14	:
MEAN	11.	11.	11.	11.	11.	12.	12.	12.	11.	11.	11.	11.	12.	12.	12.	11.	13.	:

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

LETTING (CH4)

C-R SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

WIND DIRECTION

CONCENTRATION

06/1143

GT 2400 :

2200 - 2400 :

2000 - 2200 :

1800 - 2000 :

1600 - 1800 :

1400 - 1600 :

1200 - 1400 :

1000 - 1200 :

800 - 1000 :

600 - 800 :

400 - 600 :

200 - 400 :

LT 200 :

TOTAL :

MEAN

854. 854. 858. 873. 867. 872. 858. 847. 839. 850. 849. 852. 853. 875. 854. 855. 852.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

NON-METHANE HYDROCARBONS

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

CONCENTRATION UG/M**3 GT 3000 :	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION								NNW	NW	NNW CALM	TOTAL
									S	SSW	SW	WSW	W	WNW	W	WSW				
2800 - 3000 :																				:
2600 - 2800 :																				:
2400 - 2600 :																				:
2200 - 2400 :				1				1					1							:
2000 - 2200 :			0			1		0					0							:
1800 - 2000 :			0			1		1		1			0							:
1600 - 1800 :			0			0		0		0			0							:
1400 - 1600 :			0			0		0		0			0							:
1200 - 1400 :			0			0		0		0		1	0				1			:
1000 - 1200 :	2	2	0	0	1	2	5	2	1	8	6	3	2	4	3	2	3	2	1	:
800 - 1000 :	2	0	0	0	1	1	2	4	2	4	3	2	5	7	9	0	0	0	1	:
600 - 800 :	0	0	2	1	0	0	20	3	4	1	2	1	1	2	3	1	1	1	1	:
LT 600 :	119	76	85	111	167	154	202	368	494	931	678	271	200	160	113	107	113	107	11	:
TOTAL :	123	78	87	113	169	159	229	379	502	945	689	277	209	173	129	110	14	4385	14	:
MEAN	287.	293.	298.	304.	297.	340.	352.	335.	286.	270.	270.	283.	305.	319.	334.	274.	447.	447.	294.	:

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

CARBON MONOXIDE (CO) TRAILER NO. - 23 PERIOD (7/1/77 TO 7/31/77) C-B SHALE OIL PROJECT

CONCENTRATION PPM/1000		WIND DIRECTION																	TOTAL
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	
3750 - 4250 :																			:
3500 - 3750 :																			:
3250 - 3500 :												1							:
3000 - 3250 :								1				0							:
2750 - 3000 :								1				0							:
2500 - 2750 :								0				0							:
2250 - 2500 :								0				0							:
2000 - 2250 :								0				0							:
1750 - 2000 :								0				0							:
1500 - 1750 :								0				0							:
1250 - 1500 :								0				0							:
LT 1250 :	158	90	100	135	226	208	261	426	588	1030	740	293	246	216	174	137	19	5053	
TOTAL :	158	90	100	135	226	208	261	426	588	1030	740	294	246	216	174	137	19	5056	
.....																			
MEAN	320.	204.	311.	293.	320.	318.	290.	289.	287.	270.	262.	272.	284.	289.	329.	303.	367.	285.	

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

WZONE(03)

TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77) C-B SHALE OIL PROJECT

CONCENTRATION UG/GRAMS BT 2.00 :		WIND DIRECTION																	TOTAL
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	
220 -	249 :									4	3	4	1	2		1			
200 -	220 :																		
180 -	200 :																		
160 -	180 :																		
140 -	160 :																		
120 -	140 :	1	1						4	3	4	1	2		1				17
100 -	120 :	51	23	25	18	32	27	47	64	95	327	259	97	84	84	106	56	3	1378
80 -	100 :	72	46	59	64	119	124	115	204	355	628	372	161	123	87	49	60	12	2650
60 -	80 :	35	25	24	45	67	54	93	155	133	149	122	36	38	48	18	24	4	1070
40 -	60 :	4	1	3	10	13	7	12	16	14	12	6	2	2	1	3	3	0	109
20 -	40 :	6	0	0	0	0	0	0	0	2	1	0	1	0	0	0	0	0	4
LT	20 :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL :		153	96	111	137	231	212	267	439	603	1100	763	298	249	220	177	143	19	5228
MEAN		92.	90.	88.	83.	84.	86.	85.	85.	87.	92.	94.	95.	94.	94.	99.	94.	87.	90.

TABLE VIII
DIURNAL VARIATION OF VARIOUS RECORDED PARAMETERS

DIURNAL VARIATION OF NITROGEN OXIDES (UG/M**3)
TRAILER NO. - 23 PERIOD (7/ 1/77 TO 7/31/77)

HOUR

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 MEAN

DAY

1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
11	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
14	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
15	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
24	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
26	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
29	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
MEAN																							0

TOTAL NUMBER OF OBSERVATIONS = 7529, MEAN = 1.

* DENOTES A VALID SAMPLE BELOW THE MINIMUM DETECTABLE LIMIT OF THE INSTRUMENT

: INDICATES CALIBRATION DURING THE HOUR

JOURNAL VARIATION OF NITRIC OXIDE(UG/M3)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)**

DAY

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
24	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
26	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
29	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MEAN																									

TOTAL NUMBER OF OBSERVATIONS = 7511, MEAN = 0.

* DENOTES A VALID SAMPLE BELOW THE MINIMUM DETECTABLE LIMIT OF THE INSTRUMENT

: INDICATES CALIBRATION DURING THE HOUR

**DAILY VARIATION OF NITROGEN DIOXIDE (UG/M*3)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)**

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
11	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
14	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
15	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
24	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
26	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
29	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
MEAN																									

TOTAL NUMBER OF OBSERVATIONS = 7529, MEAN = 1.

* DENOTES A VALID SAMPLE BELOW THE MINIMUM DETECTABLE LIMIT OF THE INSTRUMENT

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF SULFUR DIOXIDE (UG/M**3)
TRAILER NO. - 23 PERIOD (7/ 1/77 TO 7/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL NUMBER OF OBSERVATIONS = 7910. MEAN = 0.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF SULFUR DIOXIDE (UG/M**3)
TRAILER NO. - 23 PERIOD: 7/1/77 TO 7/31/77

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MEAN	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TOTAL NUMBER OF OBSERVATIONS = 7900. MEAN = 1.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF TOTAL HYDROCARBONS (UG/M**3 X 10**+1)
TRAILER NO. = 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	HOUR																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	117	117	119	119	119	118	120	123	110	110	110	112	113	110	99	102	104	104	106	107	107	105	108	108	111
2	107	109	107	104	107	127	109	110	108	108	108	108	109	109	108	110	111	112	112	111	111	111	112	112	
3	113	112	115	115	113	112	113	114	1103	107	111	113	114	114	114	113	113	113	114	114	115	114	115	116	
4	115	114	115	114	112	112	111	111	112	113	113	112	111	111	109	107	109	108	108	107	108	108	109	111	
5	109	108	108	109	127	109	109	109	99	103	105	107	107	107	106	108	110	110	110	111	111	110	111	111	
6	111	109	108	107	108	108	109	112	113	108	109	109	109	113	109	106	99	99	104	108	109	110	111	112	
7	112	113	115	116	116	116	117	119	118	108	103	108	110	114	112	113	114	114	115	115	114	115	114	115	
8	115	115	115	115	114	114	117	117	101	99	102	103	105	105	107	108	109	110	111	111	111	112	112	111	
9	112	113	111	111	111	111	112	113	112	112	110	110	109	109	108	109	108	108	108	109	109	110	109	111	
10	109	108	109	110	110	111	111	112	111	111	111	111	110	110	110	110	110	110	110	112	113	113	113	114	
11	116	117	116	115	114	114	114	108	104	102	100	106	108	108	109	111	111	111	111	111	110	111	111	111	
12	111	112	112	113	113	112	116	117	108	100	104	106	107	108	109	109	109	110	110	110	110	111	109	111	
13	109	108	109	109	108	106	105	103	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94		
14	145	160	162	144	144	145	147	148	98	104	108	111	131	114	113	116	118	118	119	119	119	119	119	119	
15	121	119	120	119	120	120	121	115																	
16	103	101							183	173			151	160	147	189		146			177			197	
17									120	111	101	106	110	98	104	108	110	110	111	113	112	112	112	169	
18									128	105	109	111												109	
19	104	103	109	104	104	104	123	108	116	128	105	109	111											10	
20																									
21																									
22																									
23	119	119	119	119	119	119	119	121	122	124	119	119	120	121	121	124	125	106	112	114	115	116	117	117	
24	117	117	123	118	118	117	118	119	120	121	122	123	123	122	122	120	120	119	119	117	117	118	117	117	
25	116	117	117	121	116	117	120	113	108	115	118	121	121	122	123	123	124	124	124	121	119	118	117	116	
26	115	116	116	116	116	116	118	122	120	134	140	106	110	113	116	119	119	137	122	121	119	119	118	118	
27	119	135	119	118	118	118	119	107																	
28	126	120	125	124	125	126	127	129	116	119	109	116	121	125	127	128	127	130	126	125	127	126	126	126	
29	122	123	123	123	123	123	125	127	130		104	103	107	110	111	113	115	114	114	113	112	111	118	120	
30	114	109	109	110	110	109	111	113	116	127	126	124	124	123	124	124	122	121	121	120	120	119			
31	120	120	120	120	121	121	122	123	125	125	125	123	121	119	119	118	119	119	119	117	115	114	113	112	
MEAN	118	118	116	116	116	116	117	116	112	115	113	111	115	115	114	116	114	115	115	115	116	115	119	119	

TOTAL NUMBER OF OBSERVATIONS = 6859. MEAN = 116.

* INDICATES CALIBRATION DURING THE HOUR

JOURNAL VARIATION OF METHANE(UG/M**3 X 10**+1)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	84	85	96	87	84	85	85	85	85	84	85	84	84	83	83	83	83	83	83	83	83	83	83	83
2	84	85	83	84	84	83	83	83	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84
3	84	84	85	86	85	84	84	84	84	84	82	82	82	83	82	82	82	82	82	82	82	82	83	83
4	85	82	81	81	81	80	81	81	81	81	81	80	81	80	80	80	81	80	81	81	80	81	80	81
5	81	81	81	81	81	81	81	81	81	81	81	81	81	81	82	82	83	82	83	83	84	83	83	82
6	83	83	83	85	85	85	85	85	84	82	83	82	82	82	83	82	82	82	82	83	83	83	83	82
7	83	83	84	85	85	85	85	85	84	82	83	82	82	82	83	82	82	82	82	83	83	83	83	82
8	83	83	84	85	85	85	85	85	84	82	83	82	82	82	83	82	82	82	82	83	83	83	83	82
9	84	84	84	83	84	84	84	84	84	84	84	84	85	86	85	85	85	84	84	85	84	84	84	84
10	85	85	85	86	86	86	86	86	86	87	86	87	86	87	88	87	87	86	86	86	87	86	86	86
11	85	85	85	86	86	86	86	86	86	87	86	87	86	87	88	87	87	86	86	86	87	86	86	86
12	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
13	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
14	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
15	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
16	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
17	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
18	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
19	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
20	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
21	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
22	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
23	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
24	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
25	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
26	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
27	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
28	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
29	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
30	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
31	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87
MEAN	86	86	86	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87	87

TOTAL NUMBER OF OBSERVATIONS = 7297, MEAN = 85.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF NON-METHANE HYDROCARBONS (UG/M³ X 10⁴ -1)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	33	32	33	33	34	34	35	37	25	25	26	28	29	26	15	19	21	22	23	23	24	22	25	26	2
2	24	26	24	26	25	43	26	27	25	25	25	25	25	25	24	26	27	28	28	27	27	27	28	28	2
3	29	24	29	26	24	27	29	30	:	21	25	28	30	31	32	31	31	31	32	32	33	32	33	33	3
4	32	32	33	32	31	31	30	30	31	32	32	31	30	30	29	27	28	27	28	26	28	27	28	28	3
5	27	26	27	24	46	29	28	27	17	22	23	25	25:	:	24	26	27	27	27	27	28	27	27	28	2
6	28	29	25	25	26	26	28	31	32	26	28	28	28	30	27	23	17	16	22	25	26	28	28	30	2
7	29	31	30	30	30	31	32	33	34	26	20	25	28	32	30	31	34	34	35	35	34	34	34	35	3
8	35	35	35	36	35	35	37	38	22	20	20:	21	23	22	24	25	25	26	26	26	27	28	28	28	2
9	23	29	27	27	27	27	28	29	28	28	26	25	25	23	23	23	23	22	21	22	22	22	24	23	2
10	22	22	23	24	24	25	24	25	25	25	25	24	24	23	22	23	24	24	23	23	25	26	27	26	2
11	25	25	26	27	27	26	29	24:	19	19	16	20	22:	22:	24	26	27	29	26	28	29	29	29	30	2
12	33	34	32	33	33	32	35	36	29	21	24	25	27	28	29	30	31	31	31	31	31	31	32	31	2
13	30	29	34	30	30	29	27	24	17	:	:	:	:	:	:	:	:	:	28	26	33	66	52	56	3
14	58	72	75	57	57	59	51	61:	11:	18	23	25	44	28	28	29	31	31	31	31	33	34	33	33	4
15	34	33	32	31	31	31	33	28	:	:	:	:	:	:	:	:	:	:	32	33	33	34	33	33	3
16	100	65	:	:	:	:	:	:	92	81	:	:	57	69	55	96	54	54	90	103	92	103	92	92	3
17	100	65	:	:	:	:	:	:	:	:	7	7	12	13	5	8	12	15	17	18	17	16	14	12	8
18	100	65	:	:	:	:	:	:	:	:	11	16	16	:	:	:	:	:	:	:	:	:	:	:	1
19	100	65	5	12	12	12	30	15	23	15	11	:	:	:	:	:	:	:	:	:	:	:	:	:	1
20	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
21	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
22	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
23	31	32	32	32	31	31	31	33	35	36	32	32	34	34	34	38	38	20:	26	27	28	28	30	30	2
24	30	30	30	31	31	30	31	31	33	34	35	36	36	35	32	33	33	32	31	31	31	31	31	31	3
25	30	30	31	31	31	30	32	25	20	26	29	35	34	35	36	36	37	37	36	34	32	32	31	30	3
26	30	29	27	29	29	30	32	35	39	47	56:	19	24	27	30	29	33	51	37	35	34	34	34	31	3
27	33	31	35	34	34	34	35	23	33	36	:	:	:	:	37:	32	37	40	43	42	44	44	44	43	3
28	40	40	43	42	44	44	46	47	33	36	25	32	37	41	42	44	43	46	46	46	41	41	40	40	4
29	39	41	40	41	40	40	41	44	47	:	21	21	25	28	29	31	31	35	34	33	33	32	35	35	3
30	31	31	31	32	31	31	32	35	37	42	42	42	42	41	42	41	40	39	38	38	37	36	36	36	3
31	35	36	35	32	29	29	32	34	35	40	36	35	34	33	33	32	33	33	32	30	28	27	27	26	3
MEAN	34	34	32	31	32	32	33	32	28	30	28	26	30:	30	29	31	29	31	30	30	32	31	34	34	34

TOTAL NUMBER OF OBSERVATIONS = 6859. MEAN = 31.

: INDICATES CALIBRATION DURING THE HOUR

DAILY VARIATION OF CARBON MONOXIDE (UG/M**3 X 10**+1)
TRAILER NO. - 23 PERIOD (7/ 1/77 TO 7/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	24	24	25	24	25	25	25	25	25	23	24	24	23	23	22	23	22	22	22	23	22	23	23	23	23
2	22	22	23	23	22	23	24	23	23	23	23	23	26	24	24	23	24	23	23	24	24	23	23	23	23
3	24	24	24	23	24	22	23	23	23	23	23	23	23	23	24	23	24	23	23	23	23	23	23	23	23
4	23	22	23	23	22	23	23	23	23	23	23	23	22	23	23	23	22	26	22	22	22	22	22	22	22
5	21	23	23	22	21	22	22	22	20	20	21	22	22	22	23	23	23	22	22	22	22	22	22	22	22
6	21	20	20	21	21	22	21	21	21	22	21	22	20	22	22	21	19	18	21	22	21	21	20	21	21
7	21	19	19	20	21	22	21	19	18	18	19	20	21	20	20	19	21	19	19	20	19	19	19	18	18
8	22	19	19	19	19	18	20	19	19	19	19	20	21	21	21	22	22	21	22	22	21	21	21	21	21
9	21	19	19	20	19	18	20	19	19	19	19	20	21	21	19	20	18	19	20	19	21	21	20	20	20
10	22	19	18	19	19	19	18	20	19	19	19	18	17	19	19	20	18	18	19	20	19	19	18	19	19
11	18	18	16	18	17	17	15	21	25	24	25	27	25	25	20	27	27	28	27	27	26	25	25	25	25
12	25	25	25	26	25	26	26	27	26	25	25	26	25	25	26	26	25	25	25	25	25	25	25	26	26
13	25	25	25	25	24	24	24	24	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
14	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
15	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
16	53	53	54	54	54	55	55	54	55	60	34	34	37	37	38	39	43	47	48	49	51	51	52	53	53
17	52	51	53	52	53	51	51	49	55	60	48	49	48	61	61	59	57	56	54	54	53	53	52	50	55
18	45	45	44	47	52	44	43	52	49	49	48	49	48	48	49	48	49	48	47	48	46	44	45	46	49
19	35	35	34	34	34	34	36	35	34	34	33	33	37	36	35	38	36	35	36	36	36	36	37	35	34
20																									
21																									
22																									
23	27	27	27	27	27	28	35	27	28	29	28	28	27	27	34	27	24	24	25	26	26	27	26	27	27
24																									
25	36	29	25	26	25	25	27	26	25	29	27	26	25	26	30	35	26	27	28	26	26	26	26	25	26
26	26	25	24	26	24	24	25	26	25	26	27	25	25	26	26	25	25	25	27	27	25	25	24	25	24
27	21	22	21	20	21	20	20	19	16	20	20	32	21	21	23	22	26	22	21	22	22	21	22	21	21
28																									
29	22	20	20	19	21	20	19	20	19	21	20	22	21	21	24	21	21	22	21	22	20	20	20	21	21
30	22	21	19	19	19	19	19	19	20	20	20	20	20	20	20	19	20	19	19	20	19	18	18	18	19
31	18	17	16	19	16	17	17	15	15	15	16	15	15	14	14	14	25	15	14	13	14	14	14	13	16
MEAN	27	26	28	26	26	26	26	26	26	26	26	26	25	27	27	27	27	26	26	26	26	26	26	26	26

TOTAL NUMBER OF OBSERVATIONS = 7591, MEAN = 27.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF OZONE(UG/M*3)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	69	77	77	76	76	75	66	70	96:	90	86	81	80	82	83	78	78	75	78	77	75	71	67	70	7
2	72	77	77	72	70	67	71	83	84	80	91	97	108	104	100	102	111	113	107	103	99	91	90	91	9
3	90	77	79	71	70	70	77	77	79	93	96	95	95	93	94	95	96	95	93	89	85	79	75	74	8
4	77	77	78	67	84	80	76	84	92	94	90	83	86	80	85	86	85	83	68	50	47	45	45	49	7
5	55	54	59	58	61	60	62	71	82	86	87	87	80	88	85	87	89	91	92	87	83	80	79	76	7
6	90	92	84	60	74	70	73	80	87	88	83	89	81	96	97	97	97	99	92	86	74	75	80	79	8
7	77	62	66	67	67	60	71	85	86	90	91	90	88	89	89	85	90	91	88	81	72	72	75	71	8
8	74	71	74	71	75	73	62	64	70	87	86	82	83	85	87	86	91	93	92	87	83	86	78	65	7
9	72	76	75	74	74	71	68	77	83	91	92	94	96	90	97	99	93	89	92	92	86	85	88	86	8
10	84	82	84	82	80	84	85	105	107	108	112	108	105	107	109	108	109	110	110	112	104	93	96	97	9
11	92	91	95	99	101	103	84	91:	106	112	114	111	112	112	114	111	111	112	108	100	92	89	88	88	10
12	81	87	85	88	97	86	81	81	96	100	101	102	101	98	96	92	90	89	89	87	77	81	83	78	10
13	74	73	77	83	80	75	79	80	84:	84	84	84	84	100	105	106	108	108	111	106	101	104	93	90	9
14	84	85	90	90	90	87	95	95	100	103	104	106	108	105	108	117	117	116	113	108	104	102	97	101	10
15	86	86	87	93	89	89	77	84	96	106	112	113	111	113	117	121	119	117	115	107	113	113	104	103	10
16	97	92	92	94	86	85	84	99	104	106	109	109	109	114	115	116	115	115	112	112	92	97	97	102	10
17	101	91	95	99	97	89	85	92	104	106	109	107	104	104	103	109	110	107	102	95	93	77	74	74	9
18	87	91	85	86	91	92	80	107	111	111	109	108	110	109	107	107	109	108	106	112	111	100	100	95	10
19	05	94	82	80	73	70	74	98	110	111	111	115	116	100	107	107	109	108	106	112	111	100	100	95	10
20																									9
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
MEAN	62	77	77	76	77	77	72	70	91	96	98	98	98	100	100	101	101	101	99	94	87	84	81	81	

TOTAL NUMBER OF OBSERVATIONS = 7080. MEAN = 89.

: INDICATES CALIBRATION DURING THE HOUR

HOURLY TOTAL PRECIPITATION (HUNDREDTHS OF INCHES)
TRAILER NO. - 23 PERIOD (7/1/77 TO 7/31/77)

DAY	HOUR																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24 TOTAL	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL	3	1	4	0	0	0	0	0	0	15	9	2	17	1	0	0	0	0	0	3	1	8	7	7	2

TOTAL NUMBER OF OBSERVATIONS = 7969. TOTAL = 80.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND SPEED AT 8 FEET (MPH)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
14	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
17	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
21	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
22	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
23	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
24	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
25	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
26	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
27	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
28	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
29	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
30	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
31	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

TOTAL NUMBER OF OBSERVATIONS = 5285, MEAN = 6.

: INDICATES CALIBRATION DURING THE HOUR

DAILY VARIATION OF WIND SPEED AT 30 FEET (MPH)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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MEAN																								

TOTAL NUMBER OF OBSERVATIONS = 5285, MEAN = 9.

: INDICATES CALIBRATION DURING THE HOUR

**JOURNAL VARIATION OF WIND SPEED AT 100 FEET (MPH)
TRAILER NO. - 23 PERIOD (7/1/77 TO 7/31/77)**

DAY	HOUR																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	5	13	9	20	1	1	2	15	4	5	5	7	13	14	15	24	23	20	20	17	13	4	9	8	1
2	4	5	4	7	11	9	5	3	18	16	15	18	20	22	11	9	14	15	13	11	4	7	9	4	1
3	5	5	4	11	9	14	2	4	3	6	7	7	8	12	12	14	15	12	10	7	9	7	3	7	1
4	9	4	11	11	9	14	4	4	7	11	12	14	11	16	20	17	14	11	12	9	7	5	7	10	1
5	5	4	6	5	10	8	8	6	12	17	18	16	15	17	14	16	14	18	13	7	12	11	4	9	1
6	20	14	13	7	9	7	6	5	5	5	6	13	10	7	7	12	10	11	13	8	9	6	2	8	1
7	3	5	5	2	4	3	5	5	4	7	13	11	11	13	12	9	9	11	11	6	9	8	5	2	1
8	1	2	2	1	2	2	2	3	5	10	7	11	16	10	13	18	16	17	16	11	6	9	2	5	1
9	16	12	13	9	10	6	6	7	10	19	18	17	21	22	23	22	25	23	19	16	14	16	18	19	1
10	12	4	12	17	13	21	8	20	19	20	19	22	24	22	20	20	19	19	14	12	5	14	6	2	1
11	2	4	2	1	1	2	2	4	5	11	15	18	12	12	13	14	13	16	16	16	15	4	1	3	1
12	4	2	1	1	1	4	1	4	13	15	18	17	14	13	14	14	14	12	11	9	10	12	18	17	1
13	14	13	17	14	16	24	27	26	23	16	16	20	21	19	21	19	17	16	12	5	10	14	17	7	1
14	4	13	14	14	6	7	14	12	13	13	10	14	11	15	12	8	5	5	6	10	5	6	4	3	1
15	7	5	5	2	3	3	1	3	3	4	7	6	16	15	12	4	8	9	3	6	8	8	10	13	1
16	10	4	4	6	0	6	5	4	7	9	5	11	14	5	11	4	8	5	3	3	2	1	2	1	1
17	2	0	3	6	3	3	4	3	3	5	5	11	10	13	8	5	7	17	18	5	2	7	3	6	1
18	4	7	7	4	10	0	5	10	13	11	11	10	9	10	10	7	8	8	9	17	2	6	14	16	1
19	15	19	4	6	8	4	4	8	19	15	13	11	9	10	10	7	8	8	9	17	8	8	7	8	1
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TOTAL NUMBER OF OBSERVATIONS = 5285. MEAN = 10.

: INDICATES CALIBRATION DURING THE HOUR

JOURNAL VARIATION OF WIND SPEED AT 200 FEET(MPH)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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MEAN																								

TOTAL NUMBER OF OBSERVATIONS = 5285, MEAN = 11.

: INDICATES CALIBRATION DURING THE HOUR

JOURNAL VARIATION OF WIND DIRECTION AT 8 FEET
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	216	180	221	224	252	197	271	193	163	242	353	259	211	204	219	218	215	229	229	264	301	235	143	184	22
2	123	253	259	274	256	133	123	202	200	211	222	216	221	254	331	347	236	245	251	313	109	166	151	101	21
3	324	248	251	259	230	210	197	34	18	7	358	333	207	276	214	216	232	262	283	281	307	360	183	181	26
4	158	201	194	225	201	190	276	214	252	248	240	217	199	205	199	198	211	186	206	185	153	222	198	177	20
5	103	64	60	143	203	157	157	159	181	201	211	210	218	221	225	197	204	265	353	75	139	172	103	169	17
6	175	163	177	111	111	96	89	174	225	203	35	165	131	18	339	358	355	267	269	248	217	267	188	183	18
7	85	175	221	123	105	219	146	122	119	185	205	240	247	235	242	241	301	306	278	235	214	160	206	253	21
8	222	219	161	226	197	211	79	27	15	79	90	204	205	205	202	229	227	236	260	277	258	251	186	179	21
9	173	152	170	202	145	90	40	103	134	205	205	218	220	226	236	229	229	224	236	215	196	201	196	198	19
10	217	74	184	206	209	215	237	223	216	217	232	218	225	229	230	224	221	218	229	316	272	253	256	229	22
11	224	190	119	205	230	117	84	35	319	275	214	213	218	233	245	242	245	229	222	219	214	232	73	223	21
12	195	209	140	182	207	120	54	317	208	204	215	206	205	221	232	219	228	221	224	223	223	219	198	194	20
13	167	174	188	189	194	190	187	183	186	154	170	186	183	198	216	211	211	211	259	24	193	174	169	182	18
14	111	123	159	170	151	110	147	144	198	215	226	195	252	49	86	356	340	91	139	159	151	197	85	188	15
15	138	211	211	244	200	200	85	60	9	336	311	196	309	318	290	226	222	267	231	268	174	162	218	202	23
16	107	77	98	123	110	109	78	227	211	202			162	155	154	126	121	12	344	359	236	220	240	206	15
17	180	213	183	195	111	90	107	63	278	50	114	341	341	302	330	309	326	127	181	151	334	301	216	206	20
18	177	170	205	205	183	208	135	192	213	224	240	240	295	326	343	291	267	259	222	223	291	163	209	211	22
19	207	177	172	151	152	60	97	173	204	204	216	212	266												18

MEAN 175 176 181 181 192 187 156 121 144 207 219 220 218 223 238 241 237 239 237 242 242 247 219 212 184 193

TOTAL NUMBER OF OBSERVATIONS = 5284, MEAN = 205.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION AT 30 FEET
TRAILER NO. - 23 PERIOD (7/ 1/77 TO 7/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	184	158	172	222	230	184	261	51	149	257	346	250	201	199	214	213	209	223	224	257	290	239	135	182
2	130	205	260	287	252	125	116	195	194	204	212	211	217	245	321	338	230	241	246	504	72	148	144	104
3	259	255	249	266	224	216	198	24	12	3	342	312	239	268	206	211	226	255	274	272	301	358	147	161
4	160	198	193	222	197	186	266	212	245	239	234	210	195	200	192	192	207	181	204	184	149	219	186	166
5	110	65	59	133	197	155	150	152	179	196	204	204	213	215	218	193	198	255	346	65	129	161	107	166
6	173	153	164	104	104	89	83	217	231	299	26	160	120	10	322	347	344	263	264	242	206	256	172	174
7	58	136	196	123	192	225	141	115	115	187	202	218	246	226	234	235	292	299	274	236	198	139	182	258
8	225	217	122	216	170	212	68	18	7	73	78	201	200	205	198	217	222	231	251	270	257	247	179	150
9	155	142	161	196	140	86	44	95	128	201	200	213	215	222	229	222	223	218	229	212	193	192	189	194
10	202	76	187	199	200	209	210	217	211	213	224	213	218	224	227	219	215	213	224	304	276	257	271	238
11	201	168	72	189	225	94	78	29	316	271	205	208	212	227	240	236	240	224	218	217	211	217	65	227
12	179	197	94	160	207	136	355	235	200	200	207	200	198	216	224	213	223	216	220	216	205	204	193	188
13	157	172	184	187	190	186	182	178	182	149	165	183	177	194	211	205	204	206	254	17	185	169	161	181
14	103	113	148	160	164	114	140	138	192	210	217	197	245	41	80	349	330	84	130	150	141	190	85	191
15	127	188	201	228	223	183	72	53	16	304	309	178	300	312	290	231	220	261	245	264	173	156	211	193
16	187	76	99	103	101	101	72	222	206	199			154	147	169	117	114	3	326	360	182	201	244	204
17	164	218	171	173	126	94	101	28	273	31	127	333	337	294	330	298	316	121	173	150	326	299	220	203
18	169	161	200	195	177	199	151	186	208	221	235	233	286	318	335	285	262	254	221	218	266	157	207	206
19	202	170	162	145	151	92	97	177	198	198	211	204	262											178

MEAN 167 164 165 183 184 151 118 150 201 219 214 211 220 233 236 233 234 232 239 242 208 202 202 174 186

TOTAL NUMBER OF OBSERVATIONS = 5285. MEAN = 200.

: INDICATES CALIBRATION DURING THE HOUR

**JOURNAL VARIATION OF WIND DIRECTION AT 100 FEET
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)**

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	35	119	136	342	252	50	263	45	142	250	348	259	195	200	214	213	211	223	224	258	291	250	134	181
2	165	204	254	290	257	130	121	194	194	204	213	212	218	245	323	343	231	241	248	303	39	124	134	175
3	222	294	261	286	243	248	197	35	24	7	351	332	200	270	206	209	226	257	274	274	303	351	99	137
4	153	179	194	224	206	185	268	217	244	240	235	210	195	201	193	192	207	179	208	186	150	231	178	160
5	118	93	77	3	191	161	150	151	181	196	204	204	213	215	218	194	197	256	346	66	127	153	138	170
6	172	147	161	111	108	100	91	197	223	302	28	157	115	7	352	346	346	267	267	249	216	272	140	171
7	24	72	177	181	245	37	124	114	107	189	201	216	246	228	233	238	289	302	277	251	208	117	139	305
8	25	249	130	262	124	264	62	35	12	79	87	206	199	206	198	224	222	232	251	272	267	254	136	88
9	138	131	140	181	145	104	60	97	129	201	200	214	216	223	230	221	223	218	229	213	193	189	188	192
10	203	131	105	109	202	209	212	216	212	213	224	213	217	225	220	220	219	214	221	306	302	283	321	310
11	205	199	7	130	110	154	86	45	312	270	210	207	210	228	240	237	241	224	218	218	214	236	178	253
12	192	219	149	10	160	170	206	212	202	199	206	199	198	220	224	214	223	216	219	217	210	205	189	187
13	160	172	181	187	189	185	182	177	181	150	165	183	177	193	212	204	204	206	267	20	179	167	163	186
14	173	113	142	157	173	144	140	138	192	210	219	214	243	45	82	354	333	85	126	148	138	184	111	225
15	92	159	197	229	357	140	93	56	22	303	295	185	303	310	294	250	210	264	259	277	156	153	204	189
16	187	92	120	122	104	145	89	203	206	203			154	141	152	113	111	25	12	13	85	173	172	294
17	333	240	89	152	157	79	123	132	276	42	112	339	340	297	333	306	317	126	172	136	346	307	238	203
18	167	152	207	193	174	190	172	185	207	225	235	233	200	319	338	288	268	259	225	221	279	146	209	203
19	201	170	163	145	168	136	127	191	197	199	212	206	272											179
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
MEAN	155	161	160	160	177	146	134	140	197	218	213	213	217	234	235	236	234	231	240	246	211	199	162	196

TOTAL NUMBER OF OBSERVATIONS = 5284, MEAN = 199.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION AT 200 FEET
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	357	136	115	187	279	146	259	75	146	277	359	262	205	208	223	221	220	230	232	267	302	267	144	191
2	194	210	249	300	266	140	138	203	202	212	220	220	226	253	329	347	240	250	254	310	25	113	139	195
3	215	341	288	300	270	278	213	49	33	9	338	338	258	278	212	216	235	268	284	204	313	349	64	118
4	130	173	201	232	209	195	264	227	251	247	242	216	205	209	201	200	214	191	216	196	167	250	180	166
5	143	145	141	317	202	174	165	164	191	204	212	213	221	222	226	203	204	265	352	65	124	152	167	186
6	182	149	164	133	139	134	117	186	246	306	23	169	119	14	339	347	348	271	272	252	232	274	91	181
7	338	30	156	209	260	20	138	121	123	197	208	226	251	237	244	248	296	305	281	263	234	101	126	359
8	353	299	193	227	162	139	165	53	18	82	89	212	207	223	208	221	232	244	260	282	283	270	41	51
9	194	120	143	178	162	132	74	98	135	208	208	223	225	233	239	230	231	227	238	222	207	202	199	204
10	215	210	215	214	214	210	231	224	220	221	233	221	226	235	237	220	226	222	228	316	320	309	348	360
11	196	220	339	112	172	216	125	68	325	273	222	215	224	244	251	248	252	233	228	227	225	216	227	265
12	234	230	211	191	163	184	194	197	211	209	214	207	208	227	233	223	231	224	227	227	231	228	196	195
13	173	181	138	196	198	194	191	187	191	162	175	192	187	202	223	214	212	214	275	357	187	174	172	194
14	115	116	140	152	171	159	143	149	200	218	224	217	251	47	81	360	334	86	137	154	146	187	164	282
15	77	137	145	243	17	126	138	77	35	293	301	203	306	317	297	272	236	275	249	291	125	164	200	199
16	203	198	171	164	134	134	141	215	210	215			161	139	164	126	118	30	19	15	62	119	143	6
17	154	253	35	149	211	24	129	172	280	45	109	344	344	300	336	309	320	128	178	152	303	314	296	223
18	173	174	228	206	188	197	192	193	217	234	244	238	296	321	341	294	273	266	228	225	275	163	220	211
19	210	171	163	154	148	171	196	207	206	208	223	220	270											19

MEAN 176 174 179 191 197 195 165 158 207 228 226 222 229 244 245 244 244 244 241 246 259 236 209 165 202

TOTAL NUMBER OF OBSERVATIONS = 5285, MEAN = 211.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 8 FEET
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	HOUR																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	8	10	14	6	15	7	16	34	42	39	28	29	22	21	17	14	14	13	12	11	12	14	11	12	1
2	30	19	16	10	12	13	21	18	10	15	17	14	14	10	16	18	20	14	13	9	8	8	14	10	1
3	23	12	8	7	7	4	18	21	26	28	25	26	29	18	19	14	14	15	13	8	10	11	9	8	1
4	12	12	11	14	13	10	14	14	19	15	12	11	20	16	12	12	13	10	11	13	10	7	9	9	1
5	12	20	10	11	16	9	10	18	21	12	14	15	17	14	13	13	17	12	13	11	10	11	16	11	1
6	16	10	9	13	10	11	14	21	43	30	13	13	15	19	18	16	15	22	13	6	5	12	10	10	1
7	18	12	8	14	7	10	13	18	38	24	15	16	19	22	22	19	22	15	12	10	13	23	8	12	1
8	9	9	10	8	7	10	14	23	19	21	23	21	17	25	17	14	17	13	13	11	10	10	11	14	1
9	10	11	13	15	12	14	13	15	19	15	16	14	15	16	13	13	14	13	12	12	9	6	9	10	1
10	12	17	19	10	8	11	17	12	13	15	16	15	16	16	15	15	13	16	12	8	8	10	8	14	1
11	6	10	8	5	11	8	11	13	26	22	17	15	24	17	21	18	18	14	13	9	10	17	18	14	1
12	7	12	15	9	11	9	21	30	17	16	13	16	20	21	20	21	19	15	11	8	7	7	9	9	1
13	10	10	6	9	9	12	11	10	12	14	17	16	13	11	18	15	14	11	11	19	9	11	10	16	1
14	12	10	10	9	17	25	13	14	14	16	24	24	21	20	17	19	17	13	17	9	10	11	13	11	1
15	14	8	9	11	14	9	19	18	30	38	22	22	11	12	19	32	22	15	21	10	16	12	8	10	1
16	9	10	13	7	9	11	11	21	23	24			10	24	33	24	19	21	14	5	10	3	10	12	1
17	10	6	7	9	18	8	11	27	33	25	38	11	12	13	15	27	17	15	12	11	14	11	8	8	1
18	7	9	9	7	8	8	15	13	15	23	21	26	24	12	10	14	14	13	11	10	12	8	11	10	1
19	9	8	9	8	11	13	15	18	11	13	13	17	27												1
20																									1
21																									1
22																									1
23																									1
24																									1
25																									1
26																									1
27																									1
28																									1
29																									1
30																									1
31																									1
MEAN	12	11	11	10	11	11	15	19	23	21	19	18	18	17	17	18	17	15	13	10	10	11	11	11	11

TOTAL NUMBER OF OBSERVATIONS = 5268. MEAN = 15.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 30 FEET
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	5	5	12	5	9	7	14	23	28	33	27	25	18	16	13	8	6	9	8	9	9	8	5	6
2	28	13	11	7	8	6	19	9	7	11	12	11	11	9	12	14	14	11	7	8	7	3	7	8
3	22	10	7	3	3	4	13	16	16	32	13	23	19	13	16	10	8	12	6	7	4	5	6	3
4	7	8	7	7	7	4	12	8	11	9	6	8	17	9	7	9	9	5	3	7	4	5	5	4
5	10	13	4	8	8	7	2	16	15	10	9	11	14	10	8	10	13	7	6	5	4	6	14	7
6	19	4	3	7	4	5	7	15	26	20	8	5	10	14	12	14	11	18	7	4	6	11	9	6
7	8	6	2	6	6	7	6	14	28	21	9	14	16	19	16	14	16	10	7	5	11	8	3	8
8	5	4	5	4	4	7	11	20	12	15	30	13	12	21	16	11	14	8	9	8	8	6	7	8
9	5	5	5	12	6	10	9	11	14	10	12	11	11	12	11	11	11	8	8	5	5	5	7	3
10	5	17	14	5	4	9	22	8	9	8	10	9	11	14	12	13	10	11	6	5	7	7	10	5
11	3	6	12	4	12	6	6	8	17	17	20	12	18	13	15	13	13	9	5	7	4	20	22	9
12	6	12	7	7	7	4	17	31	14	11	9	13	17	17	16	16	15	13	8	5	3	8	4	3
13	2	8	3	5	6	4	4	5	5	11	14	11	8	8	17	12	12	8	6	11	4	8	5	9
14	8	6	4	4	13	23	8	10	12	13	21	16	15	12	12	15	13	10	13	6	9	6	11	6
15	7	5	5	12	9	7	13	13	23	35	15	20	9	7	13	30	24	11	12	5	24	9	7	5
16	6	5	8	7	5	6	7	21	16	21	32	7	8	20	25	18	16	18	8	5	13	5	9	6
17	10	4	3	6	11	7	8	23	27	21	15	20	8	9	10	21	8	10	7	10	6	5	7	6
18	2	5	5	5	4	6	16	10	12	16	15	20	21	7	8	11	6	11	8	5	7	5	7	7
19	7	3	8	6	11	10	13	20	7	9	10	13	22	7	8	11	6	11	8	5	7	5	7	7
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
MEAN	9	7	7	6	7	7	7	11	15	16	17	15	13	14	13	13	14	12	11	8	6	7	7	8

TOTAL NUMBER OF OBSERVATIONS = 5265. MEAN = 11.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 100 FEET
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	18	8	5	7	12	8	14	27	24	23	20	20	14	14	10	8	7	7	6	7	7	7	4	6	1
2	26	11	8	5	7	5	19	10	7	11	11	9	9	7	8	10	12	9	4	5	5	3	7	22	1
3	17	12	4	5	6	8	22	16	21	16	14	16	19	10	14	11	5	8	5	6	7	5	3	2	1
4	4	4	4	9	6	3	17	9	11	8	5	8	13	9	9	9	8	7	6	6	4	5	3	4	1
5	6	30	10	10	6	2	3	16	11	6	8	9	11	9	8	7	12	10	7	3	2	2	19	5	1
6	9	3	3	6	3	4	7	14	26	20	8	5	5	14	15	12	11	14	7	5	3	12	5	7	1
7	13	8	4	10	4	5	4	9	24	25	10	10	17	16	13	13	16	10	6	4	8	6	3	15	1
8	13	7	5	13	9	11	11	16	11	12	18	19	12	17	13	10	11	10	5	6	8	6	10	9	1
9	4	8	4	10	7	14	6	8	11	7	11	9	9	10	10	9	7	4	9	6	5	2	4	4	1
10	7	19	6	4	6	5	20	5	7	6	6	9	10	11	10	12	8	10	7	8	5	6	9	9	1
11	3	5	8	14	15	11	5	9	23	13	17	9	16	12	11	13	10	9	5	5	2	18	40	15	1
12	3	9	10	8	12	9	11	32	14	10	7	11	15	16	15	13	11	11	6	5	3	2	5	2	1
13	4	4	3	4	5	5	4	6	5	8	12	11	9	19	16	8	9	5	6	7	5	6	3	12	1
14	6	2	3	3	11	13	7	6	9	9	18	20	11	9	9	13	9	9	17	5	6	5	16	10	1
15	7	7	3	14	7	9	9	11	21	26	17	25	7	7	12	29	19	6	19	6	24	4	5	4	1
16	7	15	15	6	3	4	8	16	15	17	21	9	6	20	21	15	14	17	13	2	4	7	11	8	1
17	6	6	8	6	23	14	12	22	24	17	12	18	7	9	11	16	10	11	6	11	7	5	7	9	1
18	4	7	4	3	3	4	9	9	10	14	12	18	22	6	7	7	9	8	5	5	11	5	4	6	1
19	5	3	12	5	9	13	14	14	6	7	7	11	22	6	7	7	9	8	5	5	11	5	4	6	1
20																									1
21																									1
22																									1
23																									1
24																									1
25																									1
26																									1
27																									1
28																									1
29																									1
30																									1
31																									1
MEAN	8	9	6	7	8	8	8	11	13	15	13	12	13	12	12	12	12	10	9	8	6	7	6	9	6

TOTAL NUMBER OF OBSERVATIONS = 5272. MEAN = 10.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 200 FEET
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	6	5	7	17	15	9	12	35	21	36	20	26	14	20	12	9	6	5	7	10	7	11	3	5	15
2	16	7	9	4	7	4	24	6	6	9	12	9	9	7	8	11	13	5	6	7	6	3	5	7	15
3	9	4	8	6	5	4	10	18	22	16	15	21	23	9	11	10	9	7	6	5	3	4	3	2	18
4	3	6	5	6	6	2	22	8	10	10	6	7	11	9	9	6	5	5	3	4	3	2	3	5	6
5	7	20	17	8	5	2	4	16	7	8	6	8	11	5	8	7	8	6	7	2	1	3	12	10	6
6	8	2	1	4	4	8	7	19	19	20	8	9	5	12	18	7	9	14	6	6	4	15	10	8	9
7	15	5	8	7	9	7	5	9	21	17	8	11	14	15	14	16	16	7	6	5	7	3	3	7	10
8	6	11	6	8	12	15	8	24	13	12	21	19	11	18	13	16	11	8	6	3	9	8	4	7	11
9	3	7	1	14	10	16	7	8	13	7	9	8	8	7	9	9	9	7	9	4	3	4	6	2	8
10	4	31	5	2	2	4	14	4	7	7	9	7	8	10	9	10	7	6	7	7	7	8	4	4	11
11	10	3	10	5	5	8	16	21	16	13	11	9	10	11	13	12	11	6	6	3	9	9	20	14	11
12	8	5	3	5	5	13	18	30	12	6	7	9	13	16	15	10	11	8	5	4	3	4	1	2	9
13	2	5	5	5	5	4	5	3	7	8	11	8	8	6	17	5	8	7	6	10	4	6	2	11	6
14	6	4	1	3	9	4	6	6	11	10	16	16	11	8	9	9	11	9	11	6	4	4	23	13	10
15	6	5	5	15	14	3	4	12	18	25	21	26	6	7	11	20	16	10	19	8	21	5	6	2	10
16	2	26	21	14	8	8	13	15	14	15	28	9	5	21	20	17	15	15	17	2	7	7	12	6	19
17	6	7	8	3	7	28	15	39	29	24	28	9	5	9	9	15	11	8	7	9	10	4	7	4	13
18	4	4	3	5	4	4	10	8	10	13	11	16	14	10	7	4	6	7	6	5	10	9	4	3	7
19	4	3	16	3	5	25	18	17	4	7	6	10	20												10
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
MEAN	7	8	7	7	7	9	11	16	14	14	12	13	11	11	12	11	10	8	8	6	6	6	6	6	6

TOTAL NUMBER OF OBSERVATIONS = 5264. MEAN = 10.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF TEMPERATURE AT 8 FEET (DEG F)
TRAILER NO. - 23 PERIOD (7/1/77 TO 7/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	62	61	59	55	53	54	57	65	71	76	78	80	82	82	82	80	76	76	73	68	66	64	63	63	63
2	53	54	54	50	57	50	61	67	71	73	75	78	79	79	76	78	80	80	77	71	66	63	64	63	63
3	61	57	57	54	52	52	57	61	66	74	76	77	79	81	81	79	77	76	74	72	69	65	62	61	61
4	51	50	63	63	62	61	60	61	64	64	65	62	64	68	68	67	66	65	60	57	54	55	54	53	53
5	52	51	52	52	53	54	50	61	64	67	69	72	72	71	69	70	71	69	63	60	58	55	54	55	55
6	57	53	55	52	50	50	57	64	68	70	67	61	65	73	74	75	75	77	75	71	63	61	61	59	59
7	57	51	51	51	49	50	57	64	69	74	77	76	76	81	81	82	81	80	76	72	66	64	61	56	56
8	55	52	55	49	52	50	55	63	70	79	78	83	80	82	83	84	83	80	78	73	71	70	67	62	62
9	53	53	52	51	51	50	52	60	73	77	77	79	80	81	82	82	81	80	78	74	69	66	67	66	66
10	61	50	54	50	59	50	54	71	73	75	77	78	80	81	81	81	81	80	78	73	67	61	60	57	57
11	53	51	52	50	50	52	56	66	71	75	78	78	80	80	81	81	81	79	77	74	69	66	66	64	64
12	50	50	53	56	53	54	60	69	74	77	80	82	82	83	84	83	84	83	81	77	69	66	70	69	69
13	57	53	50	57	66	66	50	56	66	65	69	71	72	77	79	79	79	77	75	70	68	69	66	65	65
14	52	51	50	59	58	58	55	70	75	77	79	80	78	78	78	80	78	78	78	74	70	67	64	63	63
15	64	59	57	58	56	50	50	67	73	77	79	80	78	79	78	79	82	82	80	77	76	74	68	68	68
16	50	53	52	50	60	60	56	72	76	78	81	79	78	79	81	83	82	82	80	78	72	68	66	67	67
17	54	64	51	62	63	61	57	74	77	80	81	79	78	74	75	79	83	77	70	68	67	65	63	62	62
18	61	60	63	60	59	59	52	70	72	74	75	77	79	77	76	76	76	74	73	70	68	66	64	58	58
19	57	57	55	55	55	55	57	63	66	69	70	73	73	77	76	76	76	74	73	70	68	66	64	58	58
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
MEAN	58	54	58	57	56	56	58	65	69	72	74	75	76	77	78	78	77	77	74	70	66	64	62	61	61

TOTAL NUMBER OF OBSERVATIONS = 7892, MEAN = 68.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF TEMPERATURE AT 30 FEET (DEG F)
TRAILER NO. - 23 PERIOD (7/1/77 TO 7/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	67	69	63	69	66	66	68	65	71	75	78	80	80	81	81	79	75	75	73	69	66	65	64	64
2	64	65	65	61	67	67	61	67	70	72	75	78	78	77	75	72	80	80	78	72	69	66	66	66
3	64	66	64	67	66	66	68	61	66	72	75	76	78	80	80	79	77	77	75	73	71	67	65	64
4	63	66	65	66	63	62	62	62	63	64	64	61	64	67	67	67	66	66	60	58	56	56	55	55
5	64	63	64	64	64	66	67	61	63	66	68	70	71	70	68	69	71	68	63	61	58	57	56	57
6	61	69	67	64	62	62	67	64	67	69	68	64	66	72	74	74	75	76	75	73	67	64	64	63
7	61	64	66	64	64	66	67	64	69	73	76	76	76	80	80	80	80	80	77	74	69	66	65	61
8	61	66	69	66	66	64	66	63	71	77	78	80	80	81	82	82	82	81	79	75	72	72	69	65
9	65	66	64	64	63	61	63	68	72	75	76	77	78	79	81	81	81	80	78	75	71	69	70	69
10	64	63	63	63	62	62	65	71	72	74	76	77	78	79	80	80	80	80	72	75	71	67	65	62
11	61	67	64	66	65	65	68	66	70	75	76	77	78	79	80	80	80	80	78	76	71	68	68	67
12	64	66	60	69	69	66	61	69	74	76	79	80	81	82	82	83	83	82	81	78	73	70	71	71
13	62	67	68	69	67	67	67	67	66	66	69	71	71	75	77	77	78	77	69	71	69	70	67	66
14	63	62	62	61	60	60	60	60	74	76	78	79	79	77	78	80	79	79	76	76	73	70	66	66
15	63	63	61	61	62	62	62	62	76	77	79	81	77	79	79	79	82	82	81	79	78	76	72	71
16	69	66	67	64	62	62	66	72	76	77	77	77	70	79	81	80	82	82	81	79	77	75	72	70
17	69	64	65	67	66	64	68	74	78	80	81	79	79	74	74	74	79	77	71	69	68	66	65	64
18	64	64	62	63	62	61	64	70	72	73	74	77	76	76	75	75	76	75	74	70	69	67	65	59
19	66	60	66	60	65	66	66	63	66	68	70	72	72	76	75	75	76	75	74	70	69	67	65	62
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								
MEAN	67	62	61	60	60	66	61	66	70	70	73	74	75	76	77	77	78	78	77	73	69	67	66	64

TOTAL NUMBER OF OBSERVATIONS = 5270, MEAN = 70.

: INDICATES CALIBRATION DURING THE HOUR

**DAILY VARIATION OF TEMPERATURE AT 100 FEET (DEG F)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)**

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	67	60	64	62	58	58	58	63	68	72	75	77	77	78	77	77	73	73	72	68	65	64	64	64	6
2	63	60	65	61	57	57	60	65	68	70	72	73	75	74	73	74	78	77	76	71	69	67	66	67	6
3	60	61	61	56	56	56	58	60	64	70	72	74	75	77	77	76	75	74	73	72	70	67	65	65	6
4	60	64	65	64	62	62	61	61	62	63	63	63	63	65	65	65	65	65	60	58	56	57	57	56	6
5	54	54	55	56	56	57	57	60	62	65	66	68	69	68	67	67	69	66	62	61	59	58	56	58	6
6	61	60	58	55	54	54	56	63	66	67	67	65	67	71	72	72	74	74	73	72	69	66	66	65	6
7	63	59	59	58	55	55	58	62	67	72	73	73	74	77	77	77	77	77	76	75	70	67	67	63	6
8	62	61	60	58	58	57	57	62	70	75	75	77	77	78	79	79	79	78	77	74	72	71	70	66	7
9	60	60	60	60	60	62	63	67	70	73	73	74	75	76	78	78	78	77	76	74	71	70	70	69	7
10	67	64	65	65	65	64	64	69	71	72	73	74	75	76	76	77	78	78	70	73	70	68	65	63	7
11	62	61	60	60	60	60	60	64	68	74	79	78	79	80	80	81	81	80	79	77	74	70	69	69	7
12	60	60	64	62	62	62	65	70	74	76	78	79	80	81	81	82	82	82	81	79	76	74	73	72	7
13	63	63	68	69	67	67	67	65	65	65	68	69	70	73	76	76	75	75	68	71	70	70	67	66	6
14	64	62	62	61	61	60	64	69	72	74	75	77	77	75	76	78	78	78	78	76	74	72	68	67	7
15	60	60	66	64	60	61	62	66	72	75	77	79	75	77	77	78	80	81	80	79	77	75	73	72	7
16	74	68	68	66	64	64	66	71	74	75															6
17																	81	81	80	79	78	76	74	71	7
18	71	67	68	70	67	67	68	73	76	78	79	78	77	73	73	77	78	76	70	68	68	65	64	65	7
19	60	60	64	64	62	62	64	68	70	71	72	74	76	75	74	74	74	74	73	70	68	67	65	59	6
20																									
21																									
22																									
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
MEAN	65	63	63	63	62	60	60	61	65	69	71	73	73	74	75	76	76	76	74	72	70	68	67	66	

TOTAL NUMBER OF OBSERVATIONS = 5180, MEAN = 69.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF TEMPERATURE AT 200 FEET (DEG F)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
2	62	67	67	67	66	66	55	65	64	64	68	68	76	77	78	78	79	79	77	75	74	72	72	72
3	64	67	62	62	60	60	63	67	71	72	74	74	75	73	74	76	74	74	69	68	69	67	67	65
4	65	65	66	65	62	62	63	65	70	73	75	75	74	75	75	76	76	73	77	72	71	68	67	67
5	70	67	69	67	65	65	65	70	72	74	77	76	74	76	77	78	78	79	78	76	75	73	72	72
6	71	69	69	71	67	67	68	71	74	76	77	76	75	71	71	75	76	74	67	67	64	64	65	65
7	65	65	64	64	63	63	63	67	69	70	71	73	74	73	72	72	73	72	68	67	66	64	64	59
8	57	59	56	56	55	57	58	62	65	65	67	69	69	73	72	73	72	72	71	68	67	64	64	59
9	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
10	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
11	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
12	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
13	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
14	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
15	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
16	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
17	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
18	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
19	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
20	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
21	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
22	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
23	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
24	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
25	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
26	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
27	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
28	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
29	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
30	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67
31	65	65	63	63	63	63	64	68	71	73	72	73	74	75	76	77	76	76	74	71	68	67	67	67

TOTAL NUMBER OF OBSERVATIONS = 2289. MEAN = 70.

: INDICATES CALIBRATION DURING THE HOUR

HOURLY TOTAL SOLAR RADIATION(LANGLEY)
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1	0	0	0	0	0	0	20	38	52	66	75	67	78	51	54	27	21	12	4	0	0	0	0	0	571
2	0	0	0	0	0	3	19	36	52	65	75	69	45	62	44	53	28	20	4	2	0	0	0	0	577
3	0	0	0	0	0	5	18	28	44	64	65	44	48	59	45	19	23	17	6	1	0	0	0	0	486
4	0	0	0	0	0	1	1	9	25	13	9	14	41	61	33	43	11	6	1	1	0	0	0	0	267
5	0	0	0	0	0	1	8	32	39	51	78	77	70	32	18	49	47	23	14	1	0	0	0	0	540
6	0	0	0	0	0	4	18	34	50	51	9	11	26	70	43	47	46	34	16	2	0	0	0	0	461
7	0	0	0	0	0	4	17	35	48	51	55	23	39	81	69	48	45	34	6	1	0	0	0	0	556
8	0	0	0	0	0	4	19	35	50	65	37	64	58	56	74	63	48	22	6	0	0	0	0	0	601
9	0	0	0	0	0	2	9	31	51	65	68	68	73	74	69	55	46	30	13	1	0	0	0	0	653
10	0	0	0	0	0	5	20	37	53	67	77	84	85	81	73	59	45	30	13	1	0	0	0	0	791
11	0	0	0	0	0	5	19	36	51	65	69	82	84	78	67	61	46	24	10	2	0	0	0	0	694
12	0	0	0	0	0	4	18	35	50	64	75	82	83	79	74	60	46	30	11	1	0	0	0	0	712
13	0	0	0	0	0	2	6	11	8	12	36	40	53	64	38	52	44	15	6	0	0	0	0	0	387
14	0	0	0	0	0	4	17	34	50	61	78	39	28	41	41	44	14	13	6	1	0	0	0	0	471
15	0	0	0	0	0	4	17	33	48	62	67	67	42	30	21	24	30	26	8	2	0	0	0	0	489
16	0	0	0	0	0	4	16	33	49	38	67	67	26	40	56	56	29	19	6	0	0	0	0	0	373
17	0	0	0	0	0	0	17	33	48	57	32	25	24	10	36	42	24	12	1	0	0	0	0	0	365
18	0	0	0	0	0	0	13	34	49	54	57	71	74	18	27	20	12	7	3	0	0	0	0	0	440
19	0	0	0	0	0	1	14	32	30	51	46	69	48	3						0	0	0	0	0	294
20	0	0	0	0	0																				
21	0	0	0	0	0	2	6	13	29	25	8	34	19	18	74	47	24	12	4	1	0	0	0	0	180
22	0	0	0	0	0	0	9	13	17	23	34	68	56	63	59	63	45	10	2	0	0	0	0	0	337
23	0	0	0	0	0	1	9	13	17	23	34	68	56	63	49	49	20	26	8	0	0	0	0	0	433
24	0	0	0	0	0	1	11	15	44	54	64	78	82	79	71	59	44	28	11	1	0	0	0	0	433
25	0	0	0	0	0	1	15	32	48	62	73	81	52	53	57	29	14	13	9	1	0	0	0	0	544
26	0	0	0	0	0	2	16	32	50	15	13	30	7	45	9	24	18	5	4	0	0	0	0	0	540
27	0	0	0	0	0	2	14	31	47	62	73	80	72	71	71	59	44	28	11	1	0	0	0	0	270
28	0	0	0	0	0	3	16	33	48	31	56	55	67	12	33	16	19	17	1	1	0	0	0	0	665
29	0	0	0	0	0	3	16	33	48	31	56	55	67	12	33	16	19	17	1	2	0	0	0	0	407
30	0	0	0	0	0	1	14	28	47	61	73	80	84	81	72	60	45	29	11	1	0	0	0	0	587
31	0	0	0	0	0	2	15	32	44	58	69	82	84	80	71	59	45	28	11	1	0	0	0	0	587
TOTAL/12	0	0	0	0	0	0	46	82	122	141	147	158	154	151	144	128	93	57	20	2	0	0	0	0	0

TOTAL NUMBER OF OBSERVATIONS = 7954. TOTAL = 14526.

: INDICATES CALIBRATION DURING THE HOUR

**DAILY VARIATION OF RELATIVE HUMIDITY AT 8 FEET
TRAILER NO. - 23 PERIOD(7/ 1/77 TO 7/31/77)**

HOUR

DAY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 MEAN

1	39	37	38	47	60	60	50	39	35	31	29	26	23	22	15	19	23	25	31	39	39	40	39	29
2	35	37	39	43	50	54	48	42	37	29	23	21	19	18	25	23	17	18	28	31	31	34	32	33
3	37	37	35	38	43	47	46	49	46	48	47	59	53	46	47	49	48	72	83	83	81	81	79	55
4	41	41	41	76	73	74	72	64	54	49	45	39	34	35	39	32	28	33	43	47	49	52	53	53
5	45	45	51	56	62	62	54	42	34	31	36	45	44	28	25	23	22	24	22	30	31	30	28	37
6	29	40	39	40	41	41	37	29	25	20	16	17	17	13	11	10	12	13	15	19	21	24	27	24
7	29	32	31	33	34	34	31	27	22	14	12	10	10	11	10	9	10	10	14	16	17	20	22	19
8	25	24	25	26	26	26	27	24	22	20	19	19	18	16	14	14	13	11	11	12	13	13	12	18
9	14	16	16	16	17	16	16	13	11	10	9	8	8	8	8	7	7	8	13	15	18	20	22	17
10	25	27	27	28	29	27	26	22	18	15	14	13	11	11	12	11	10	12	13	15	17	17	18	18
11	21	22	24	24	26	26	23	21	19	18	15	13	14	13	13	13	12	13	16	21	23	24	26	19
12	24	36	38	38	34	38	39	40	42	43	38	36	36	30	26	25	24	26	28	31	30	37	39	35
13	43	45	45	47	46	46	39	33	28	25	23	21	19	22	21	17	17	17	20	22	25	28	28	29
14	32	34	35	34	35	36	31	27	23	20	18	16	21	17	17	15	14	13	16	18	20	23	26	23
15	34	35	35	37	39	39	35	30	27	26			25	23	20	19	19	18	20	23	26	28	28	22
16	29	31	32	31	32	34	30	27	24	21	21	23	23	30	31	25	24	27	42	41	48	51	50	32
17	51	51	51	53	53	54	50	41	37	34	34	31	29	31	33	34	32	34	40	41	45	54	78	43
18	57	49	33	31	21	29	86	73	61	55	51	46	41											70

TOTAL NUMBER OF OBSERVATIONS = 5117, MEAN = 32.

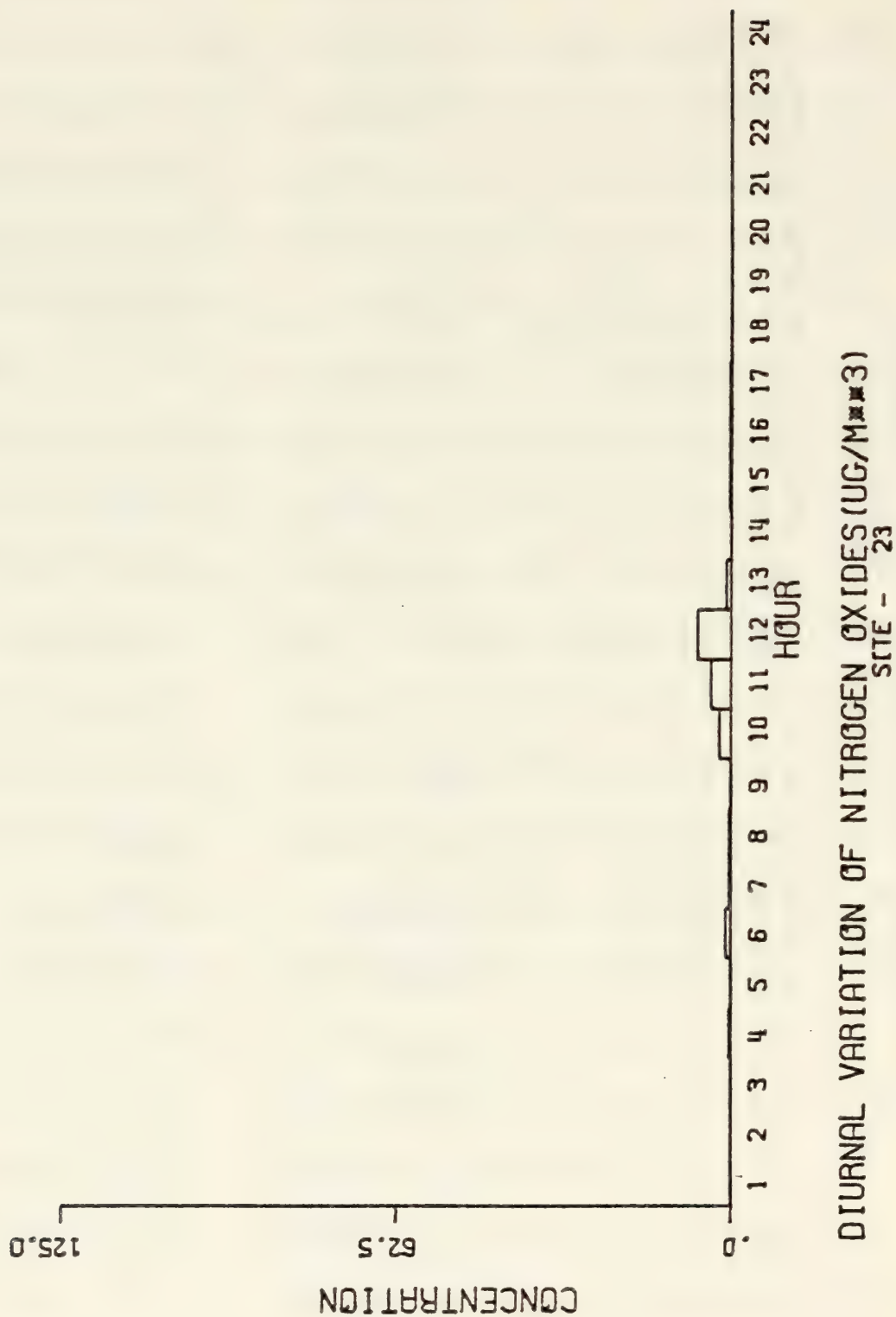
: INDICATES CALIBRATION DURING THE HOUR

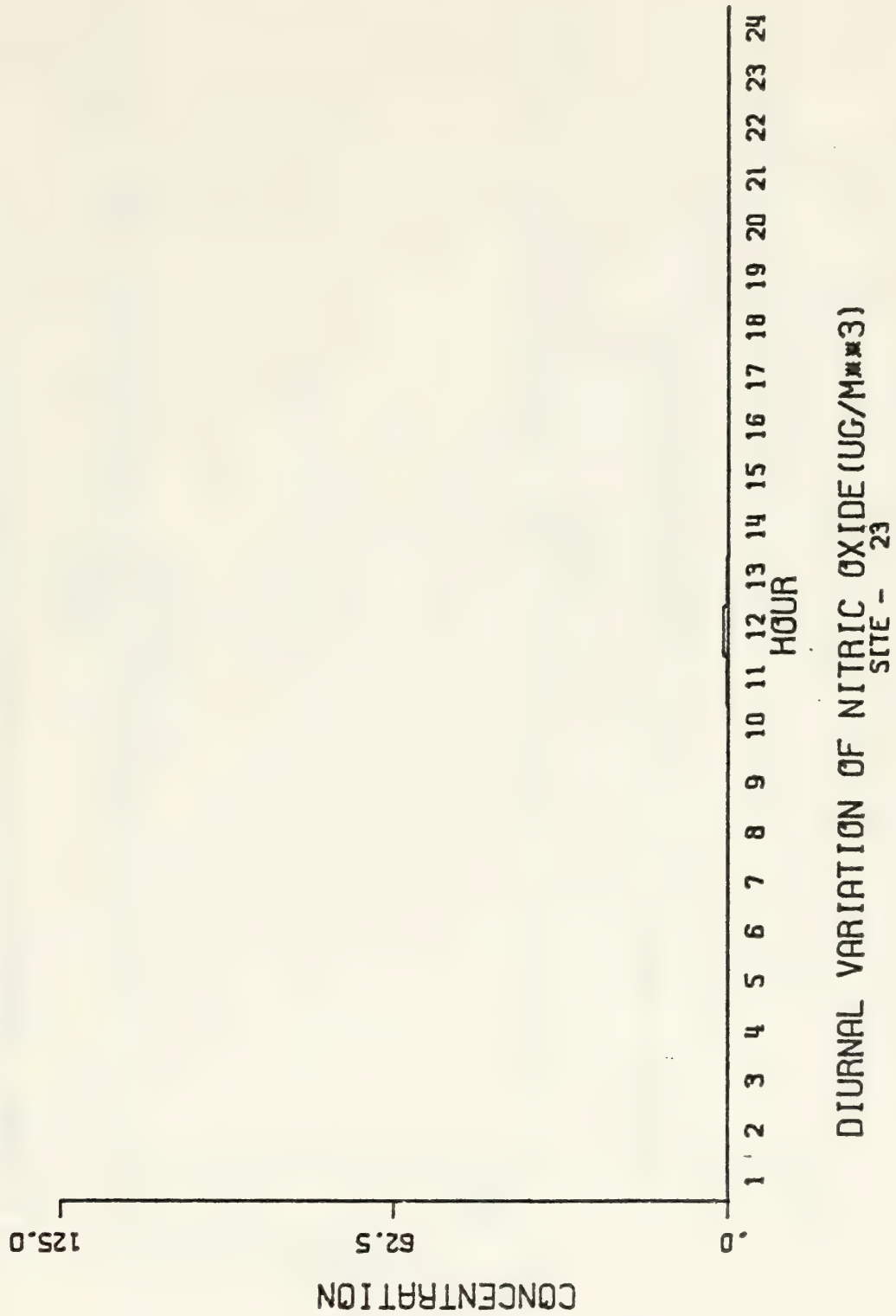
DIURNAL VARIATION OF BAROMETRIC PRESSURE.
TRAILER NO. - 23 PERIOD 1/1/77 TO 7/31/77

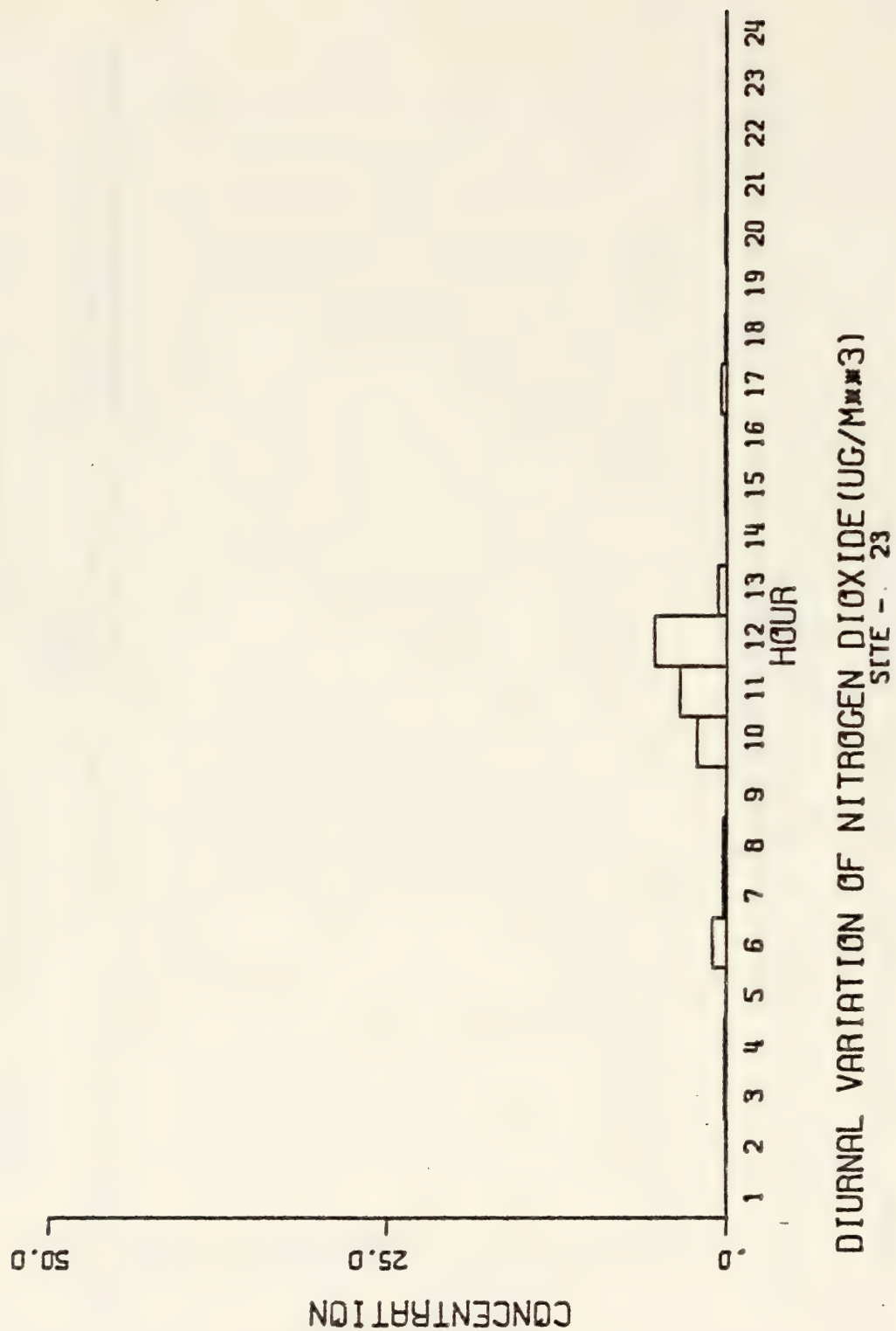
DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	792	792	792	792	792	793	793	794	793	793	793	793	792	792	791	791	791	791	792	792	793	793	793	792
2	792	792	791	793	794	793	793	793	793	793	792	792	791	791	791	790	789	789	789	790	790	790	790	791
3	790	791	791	791	791	792	793	793	793	792	792	791	791	790	790	790	790	790	790	790	790	791	791	791
4	791	791	791	791	791	791	791	792	792	791	792	792	792	791	791	791	791	791	791	791	792	792	792	792
5	792	792	792	793	793	794	794	794	795	795	794	794	794	794	794	794	794	794	794	794	794	794	794	794
6	794	795	794	794	795	795	795	796	796	796	795	795	795	795	794	794	794	793	793	793	793	794	794	794
7	794	794	794	794	794	794	795	795	795	794	794	794	794	794	793	793	793	793	792	792	793	794	794	794
8	794	794	794	794	794	794	794	795	795	794	794	794	794	794	793	793	793	792	792	792	793	794	794	794
9	793	793	792	792	793	793	794	794	794	793	793	793	792	792	792	791	791	791	791	791	791	791	791	790
10	790	790	790	790	790	791	792	792	792	792	792	792	791	791	791	790	791	790	790	791	791	792	793	793
11	793	793	792	792	792	793	793	793	793	793	793	793	792	792	791	791	791	791	791	791	791	792	793	793
12	792	793	793	793	793	793	793	794	794	794	793	793	793	792	792	791	791	791	790	790	790	791	791	791
13	791	791	791	791	792	792	792	792	793	793	793	793	793	793	792	792	792	792	791	791	792	793	793	793
14	794	794	794	794	794	794	794	795	795	795	795	794	794	794	794	794	794	793	793	793	794	794	794	794
15	795	795	795	795	796	796	796	796	796	796	796	795	795	795	795	794	794	794	794	794	794	795	795	795
16	795	795	795	796	796	796	797	797	797	798	798	798	796	796	795	795	794	794	794	794	794	795	795	795
17	795	795	795	795	795	795	795	795	795	795	795	794	794	794	794	793	793	793	793	794	794	794	795	795
18	794	794	794	794	793	793	794	794	793	793	793	793	792	792	791	791	791	791	791	791	791	792	792	792
19	792	793	792	792	792	792	792	792	792	792	793	793	792	792	792	791	791	791	791	791	791	792	792	792
20																								
21																								
22																								
23	797	797	797	797	797	797	798	798	798	797	798	797	797	797	797	796	795	795	796	796	797	797	797	797
24	796	796	796	796	796	796	796	796	796	796	796	796	795	795	794	794	794	794	795	795	796	796	796	796
25	796	797	797	797	797	797	798	798	798	798	798	798	798	797	797	796	796	796	796	796	797	797	797	797
26	797	797	797	797	797	798	798	799	799	799	798	798	798	798	797	796	796	796	796	796	797	797	797	797
27	797	797	797	797	797	797	797	798	798	798	798	798	798	797	797	797	796	796	797	797	797	797	797	797
28	797	797	796	797	797	797	798	798	798	798	798	798	797	797	797	796	796	796	796	796	797	797	797	797
29	797	797	796	796	796	797	797	797	796	797	797	796	796	795	795	794	794	794	794	794	794	795	795	794
30	794	794	794	794	795	795	795	796	796	796	796	796	795	795	795	794	794	794	794	794	795	795	795	797
31	797	797	797	797	797	797	798	798	798	798	798	798	798	797	797	796	796	796	796	796	797	797	797	797
MEAN	794	794	794	794	794	794	795	795	795	795	795	794	794	794	794	793	793	793	793	793	793	794	794	794

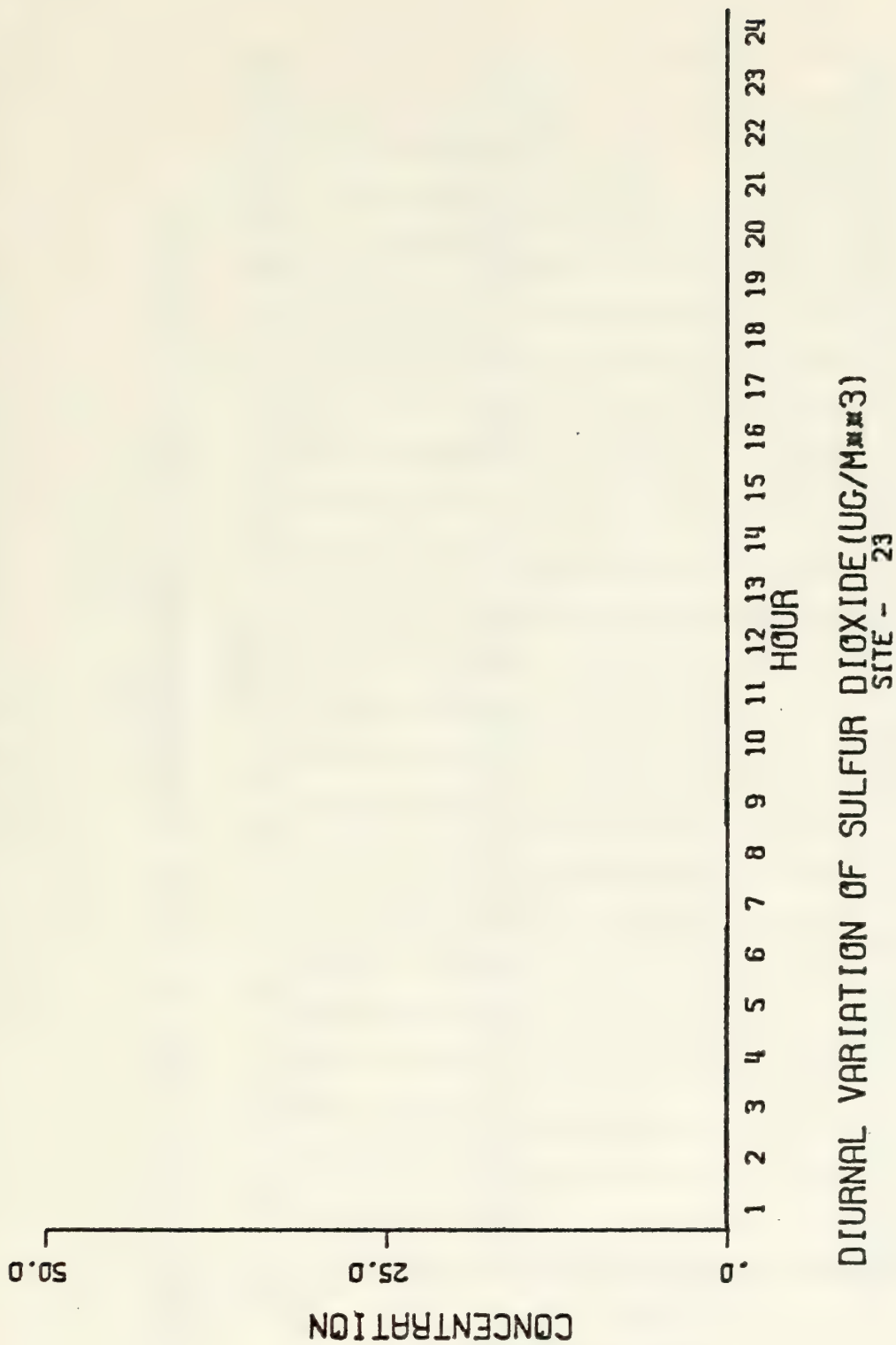
TOTAL NUMBER OF OBSERVATIONS = 7964. MEAN = 794.

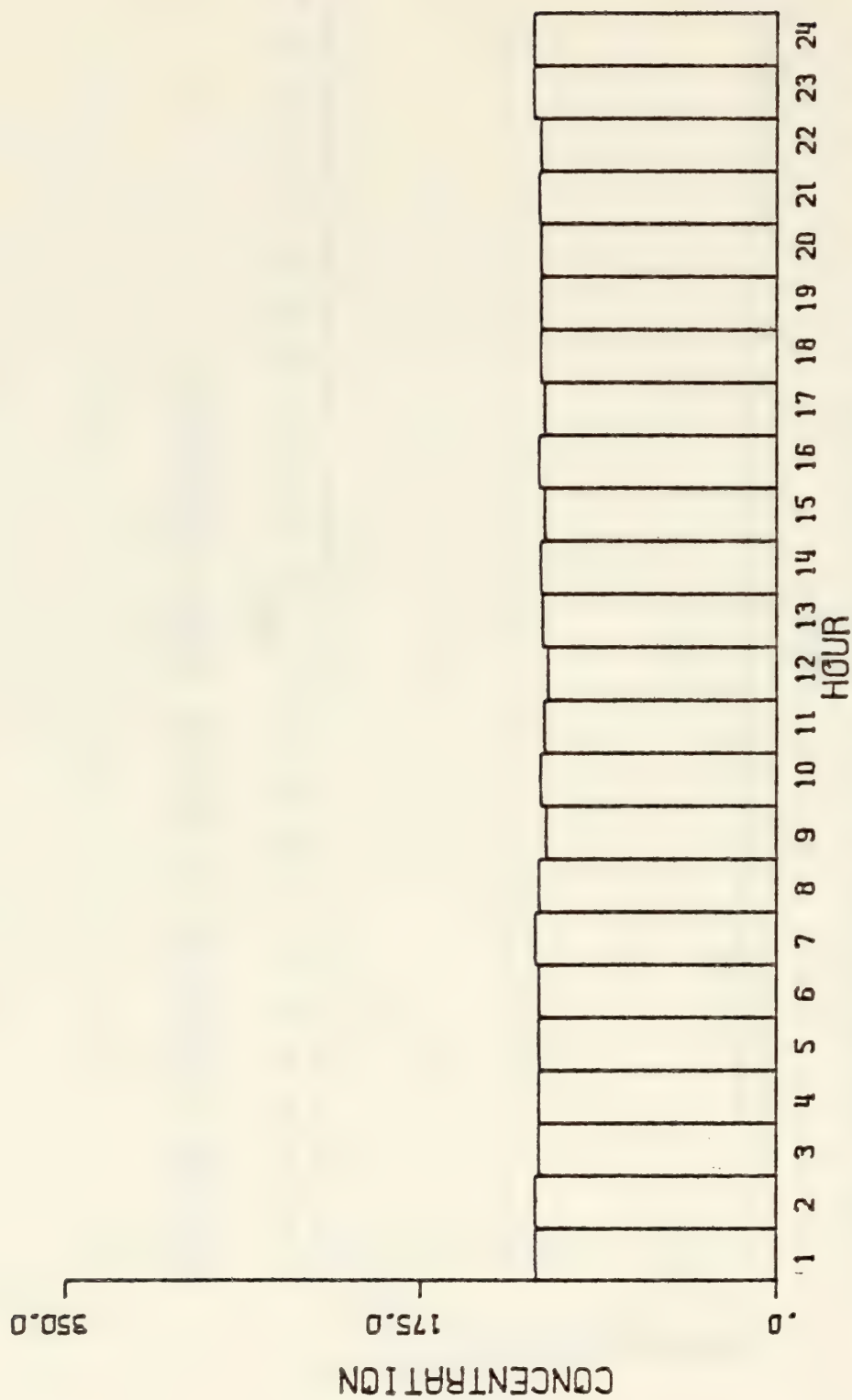
: INDICATES CALIBRATION DURING THE HOUR



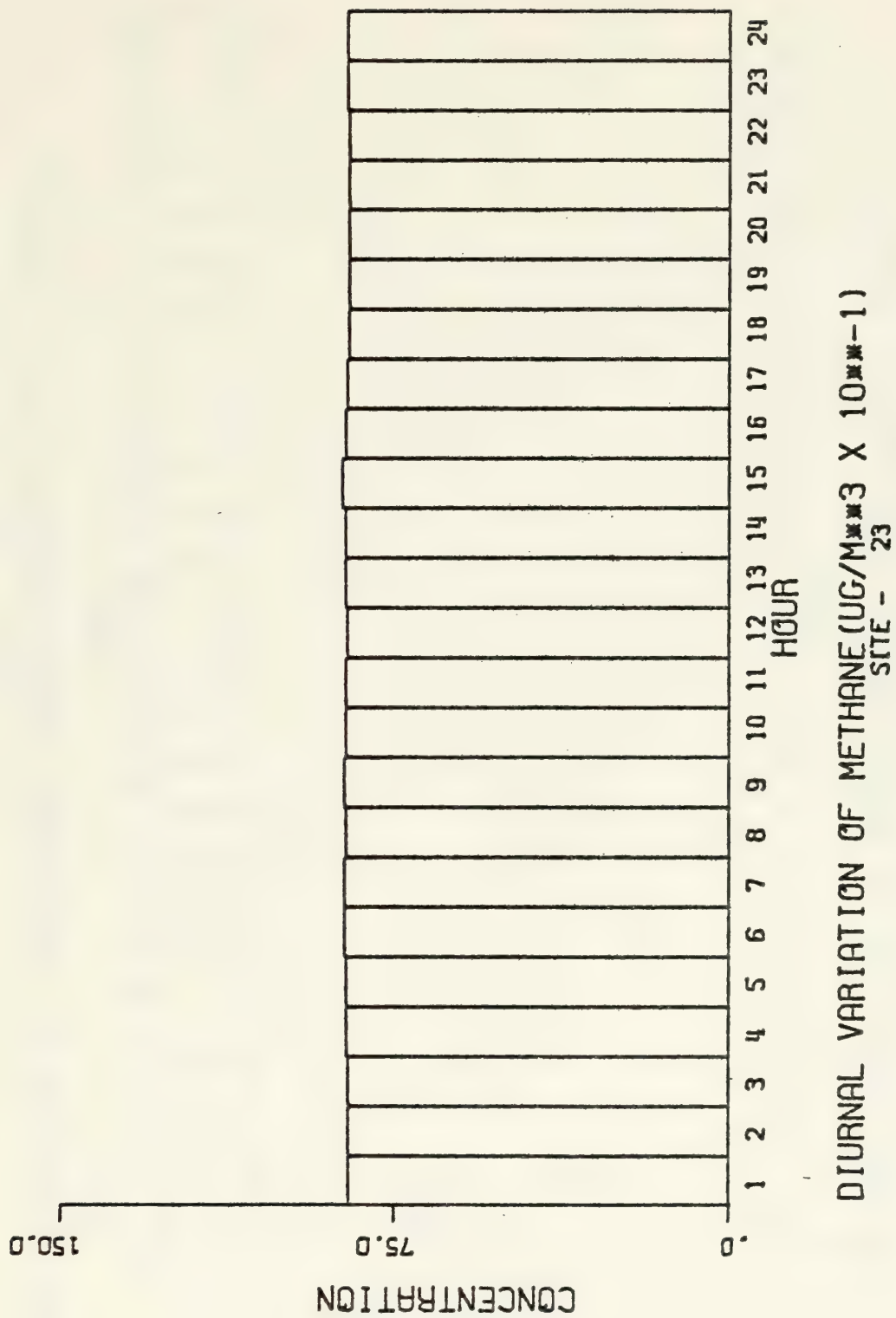


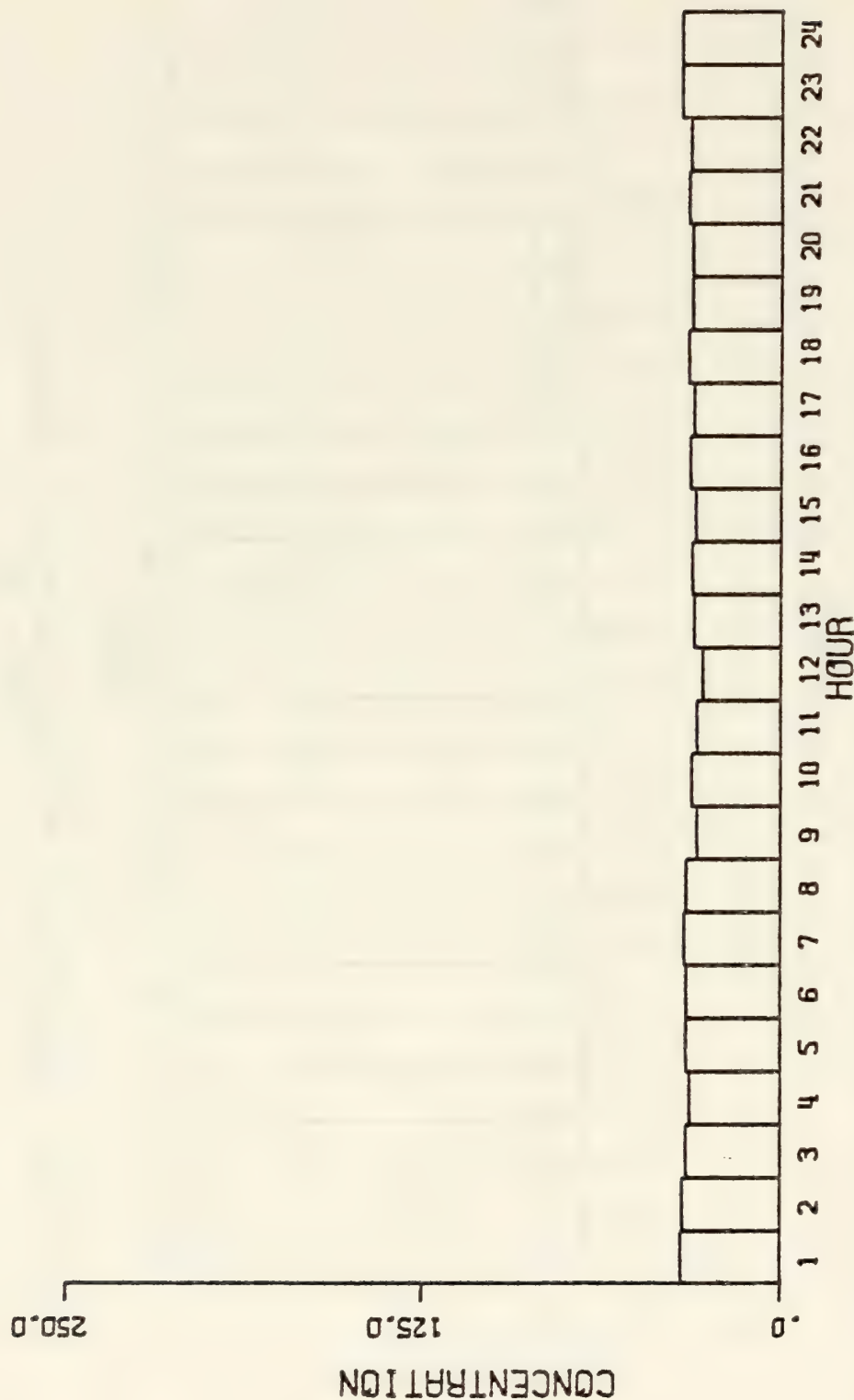




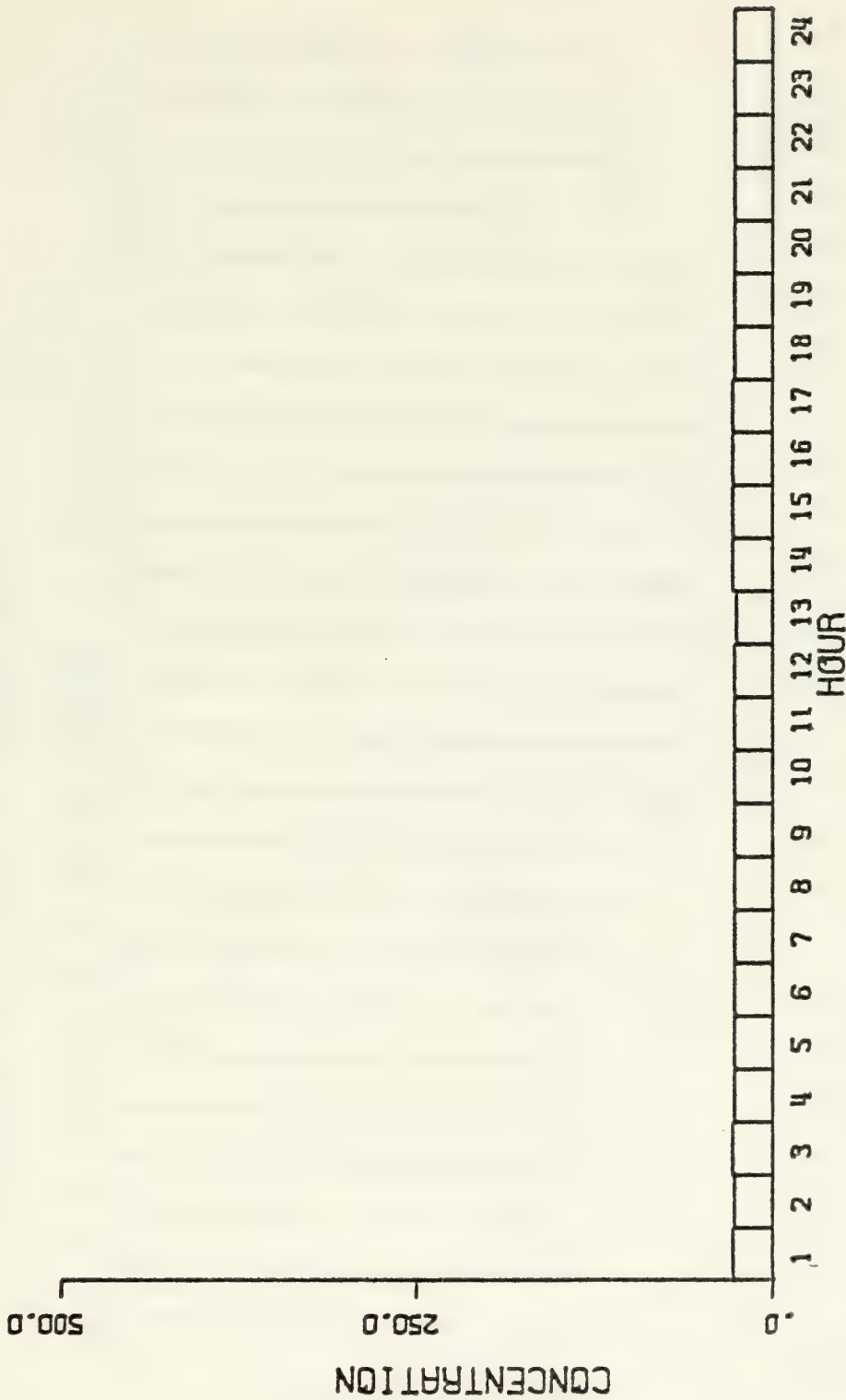


DIURNAL VARIATION OF TOTAL HYDROCARBONS (UG/MM³ X 10³-1)
SITE - 23



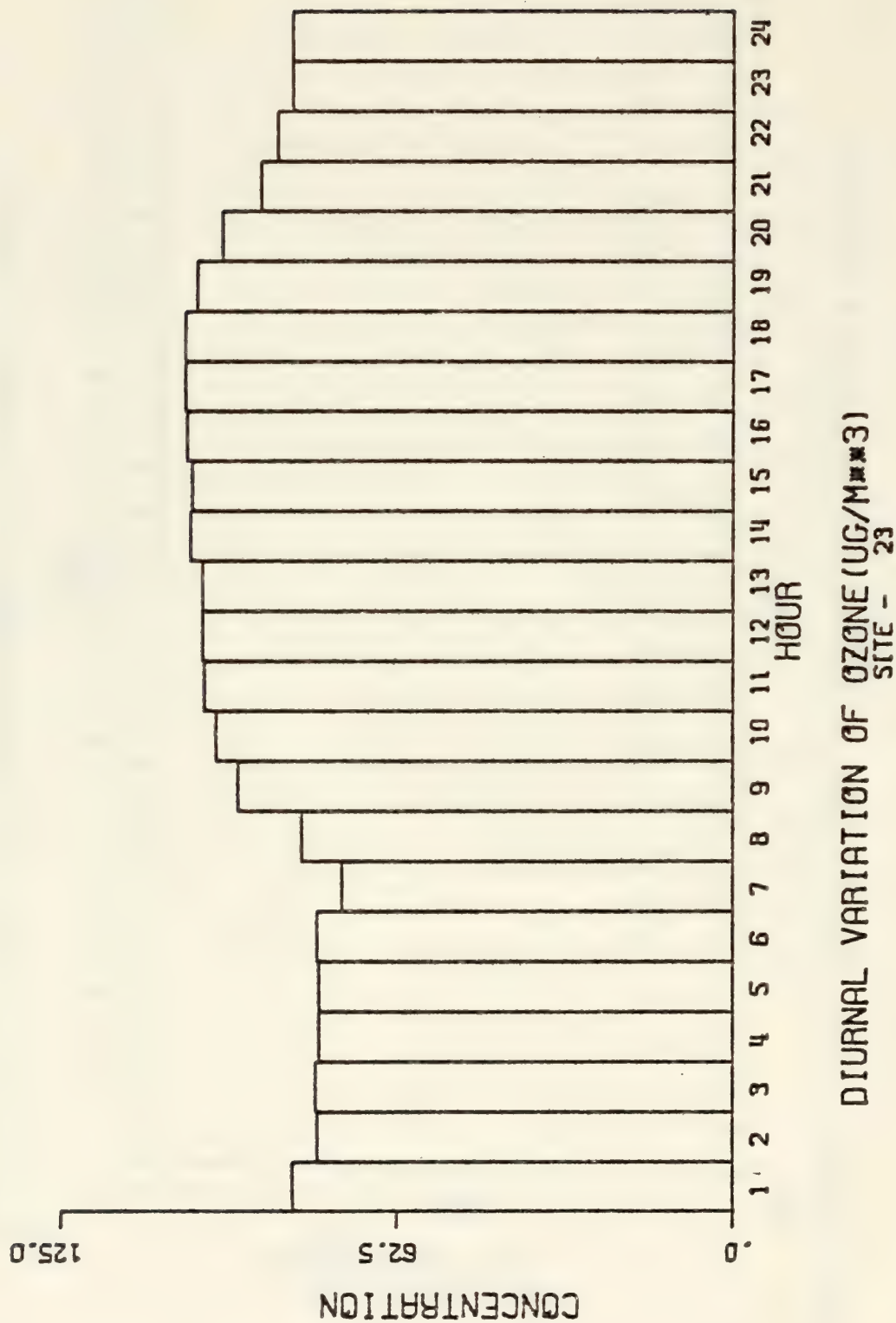


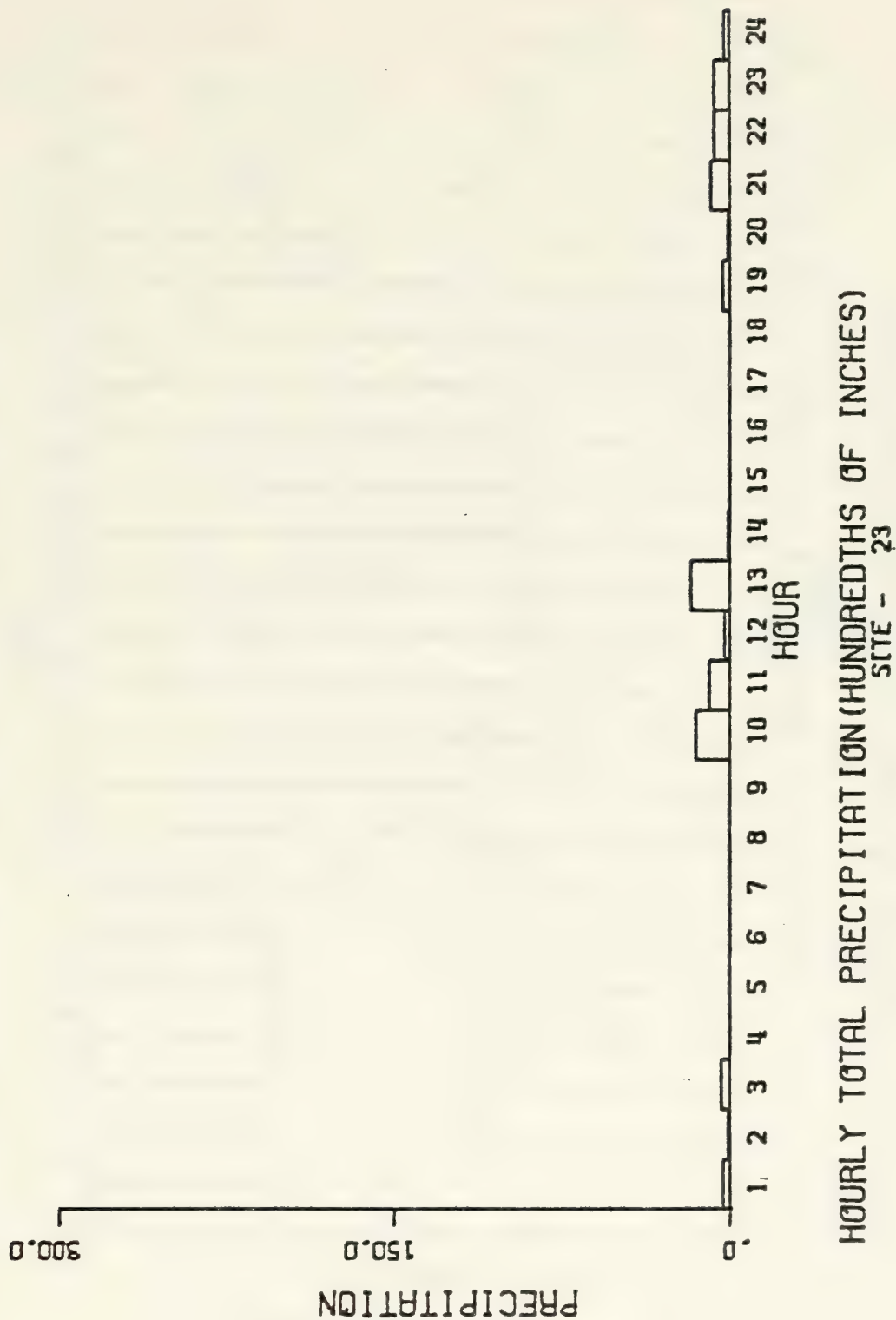
DIURNAL VARIATION OF NON-METHANE HYDROCARBONS (UG/M³ X 10³-1)
SITE - 23

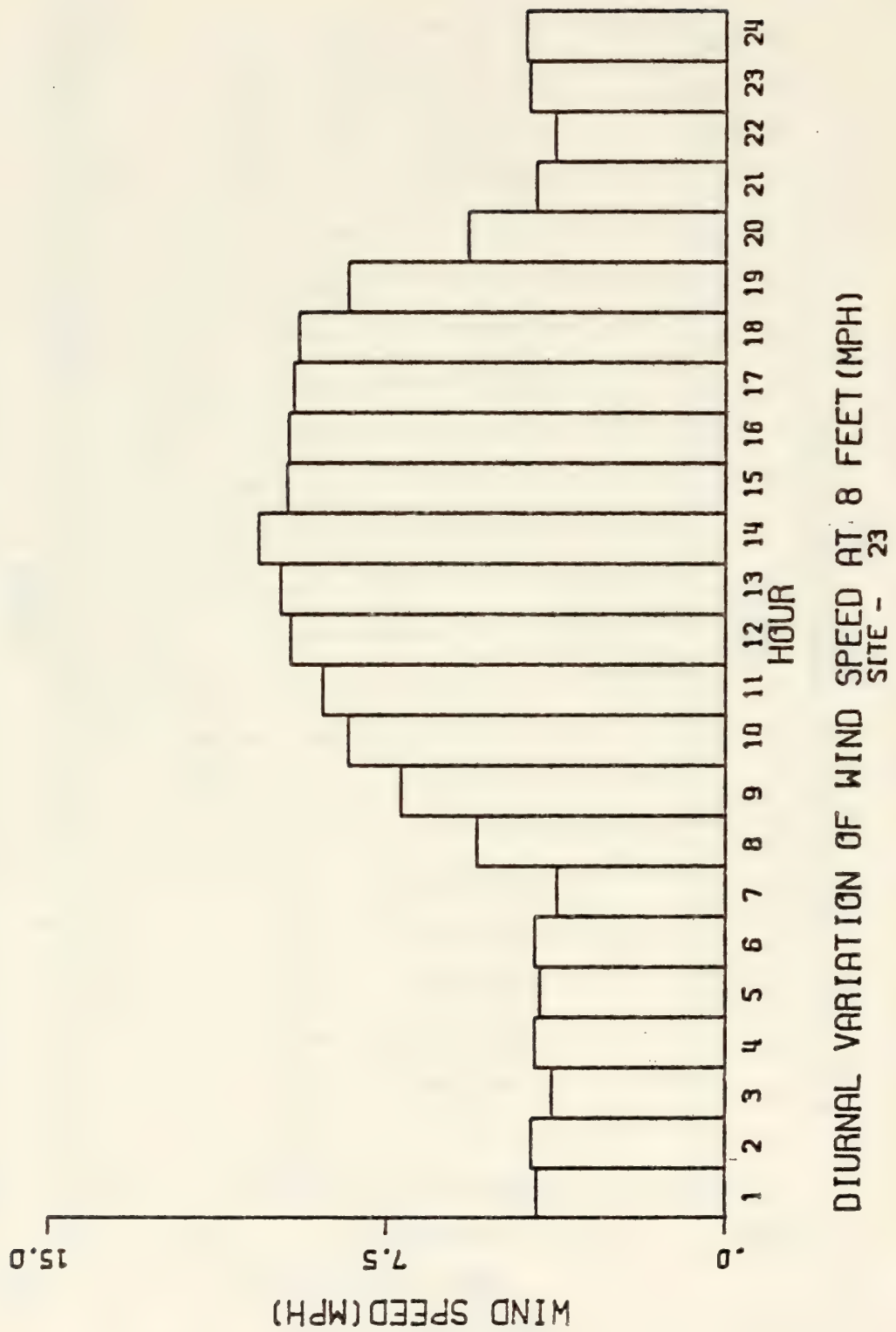


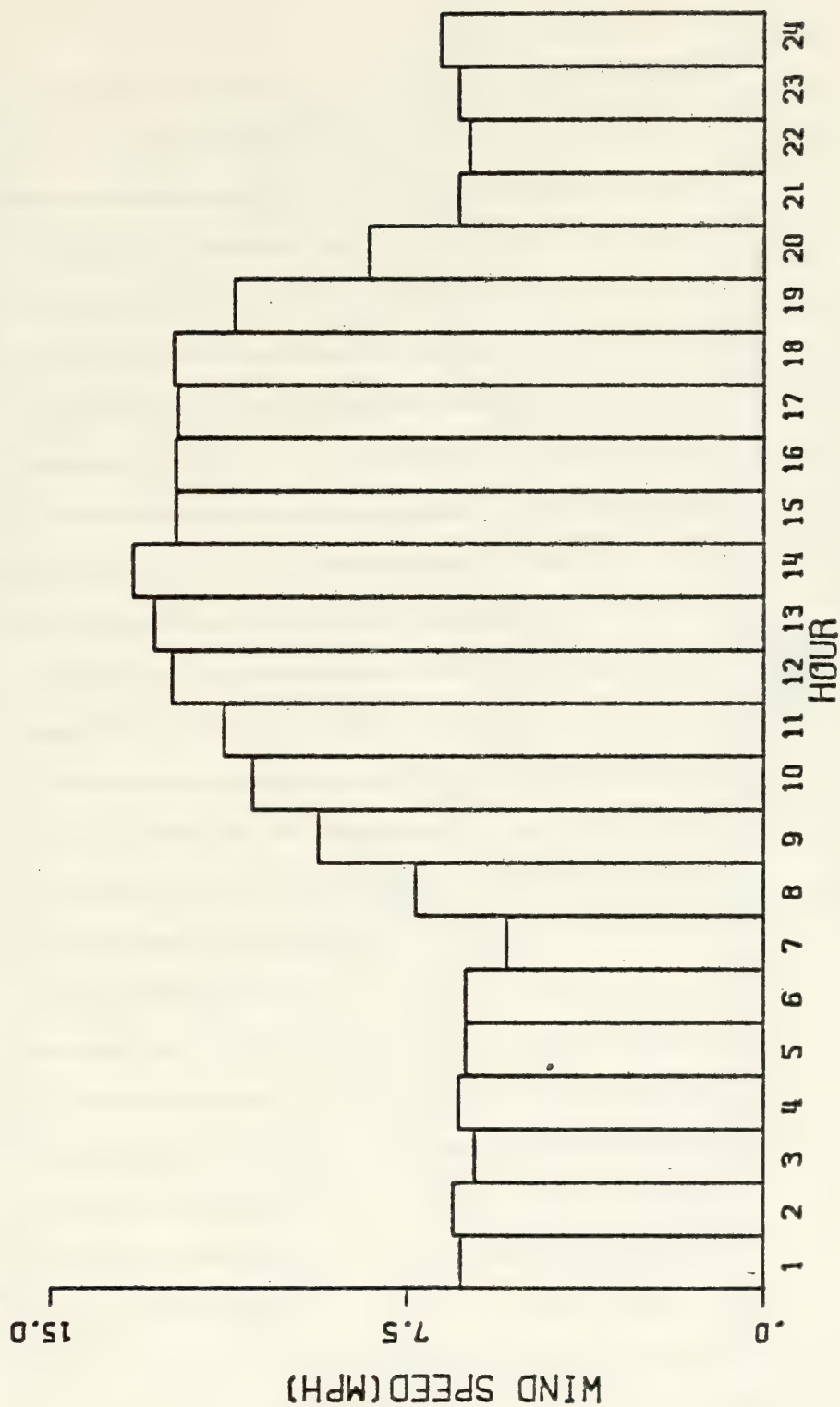
DIURNAL VARIATION OF CARBON MONOXIDE (UG/M³ X 10³-1)

SITE - 23

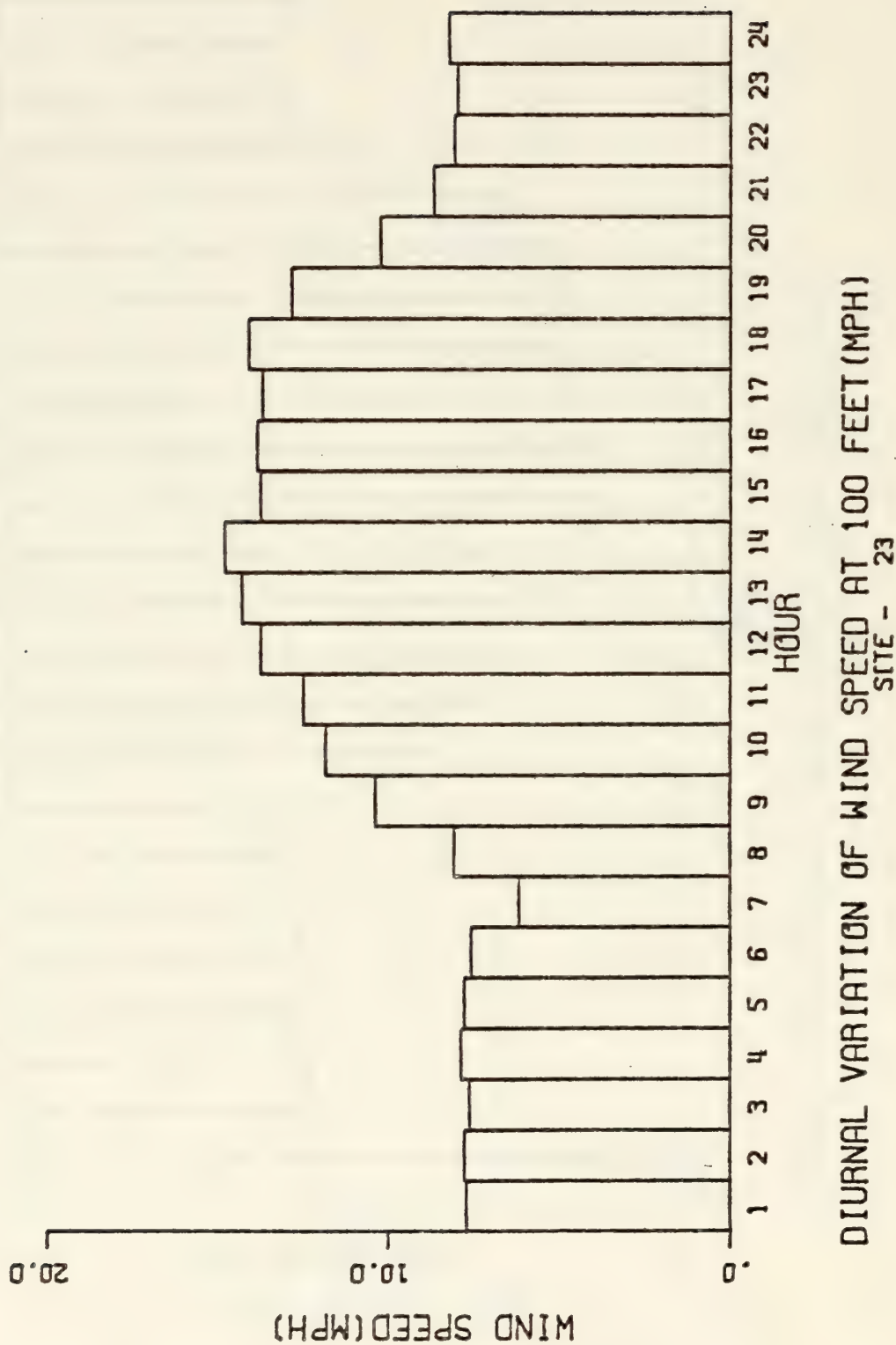


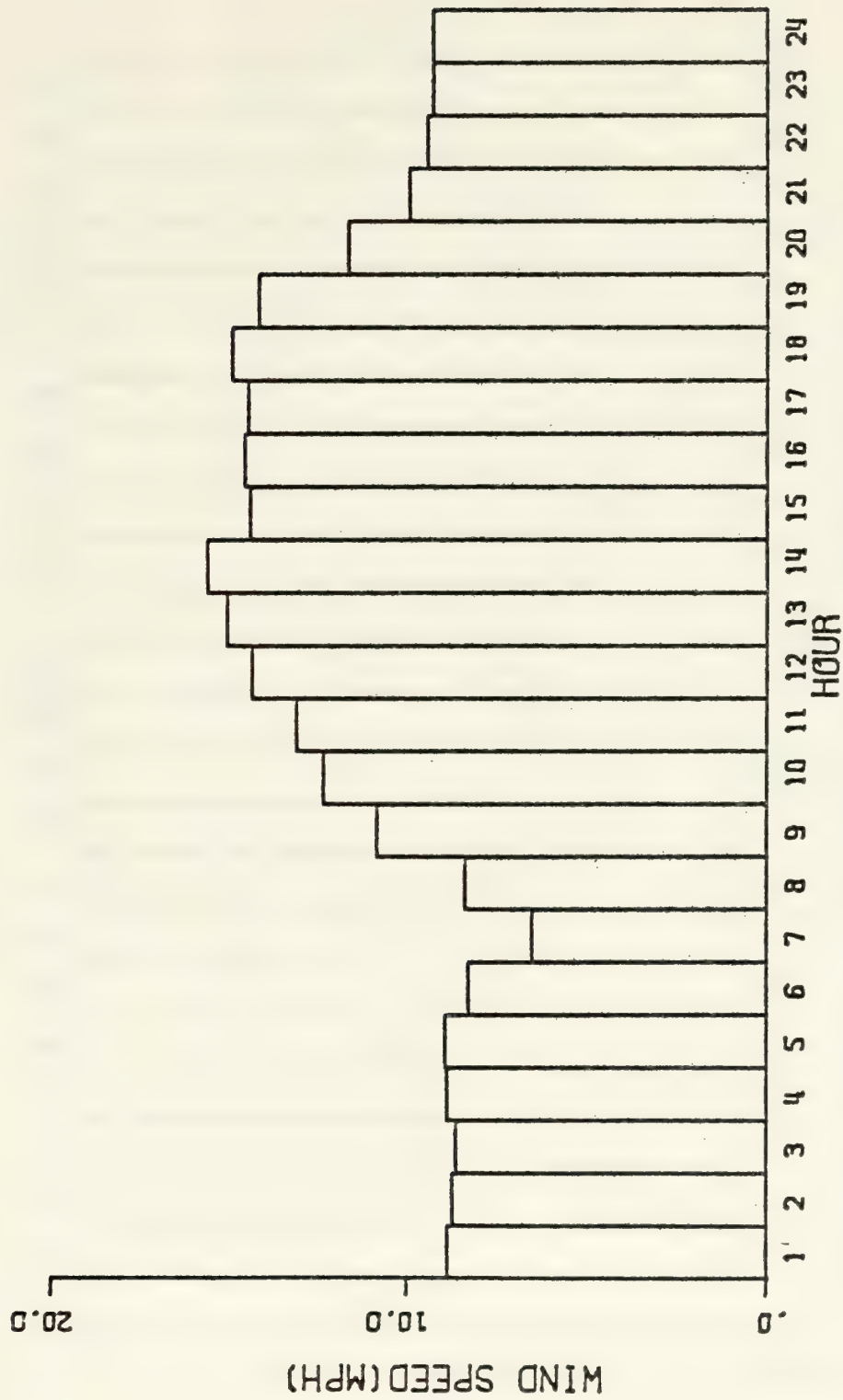




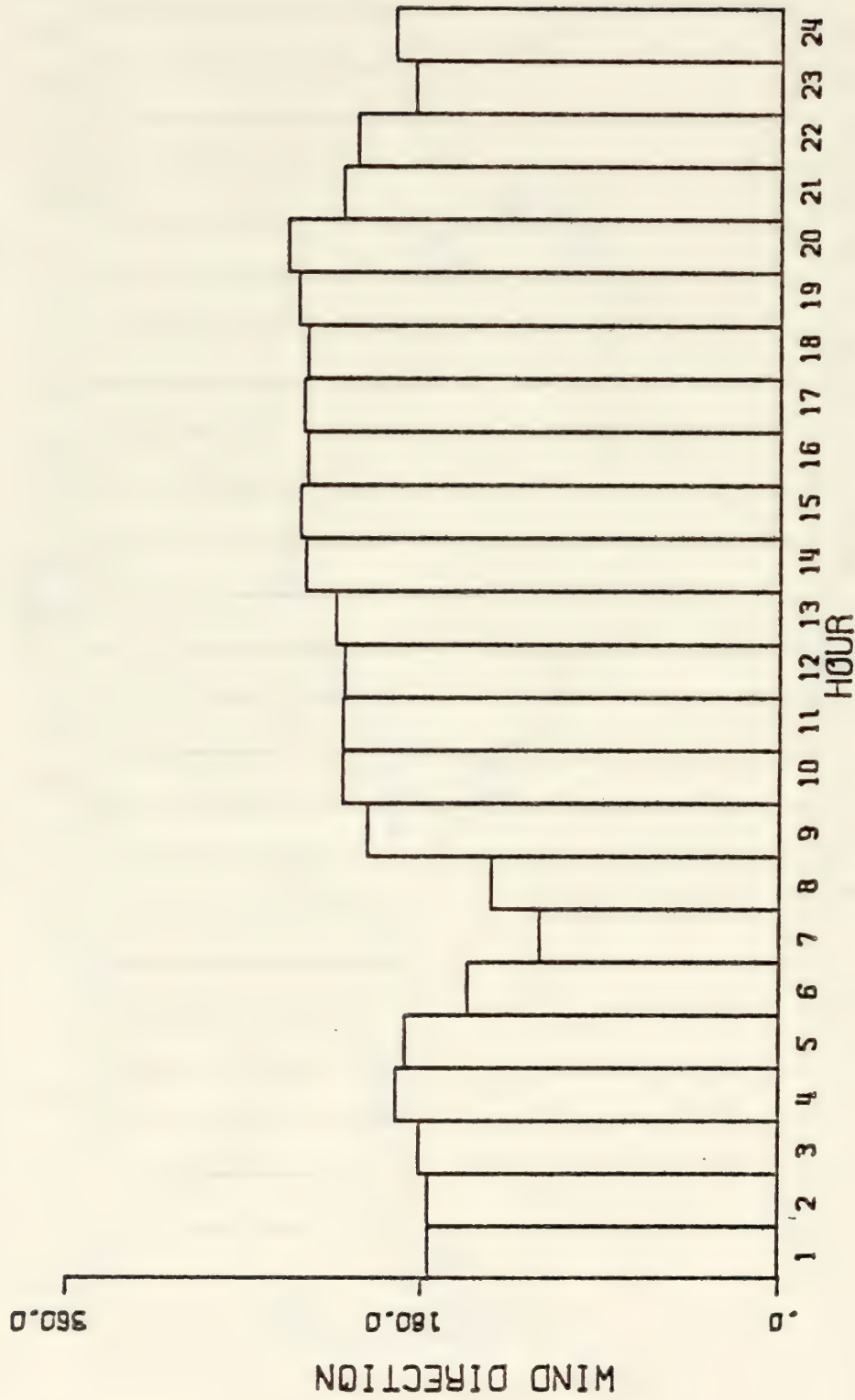


DIURNAL VARIATION OF WIND SPEED AT 30 FEET (MPH)
SITE - 23

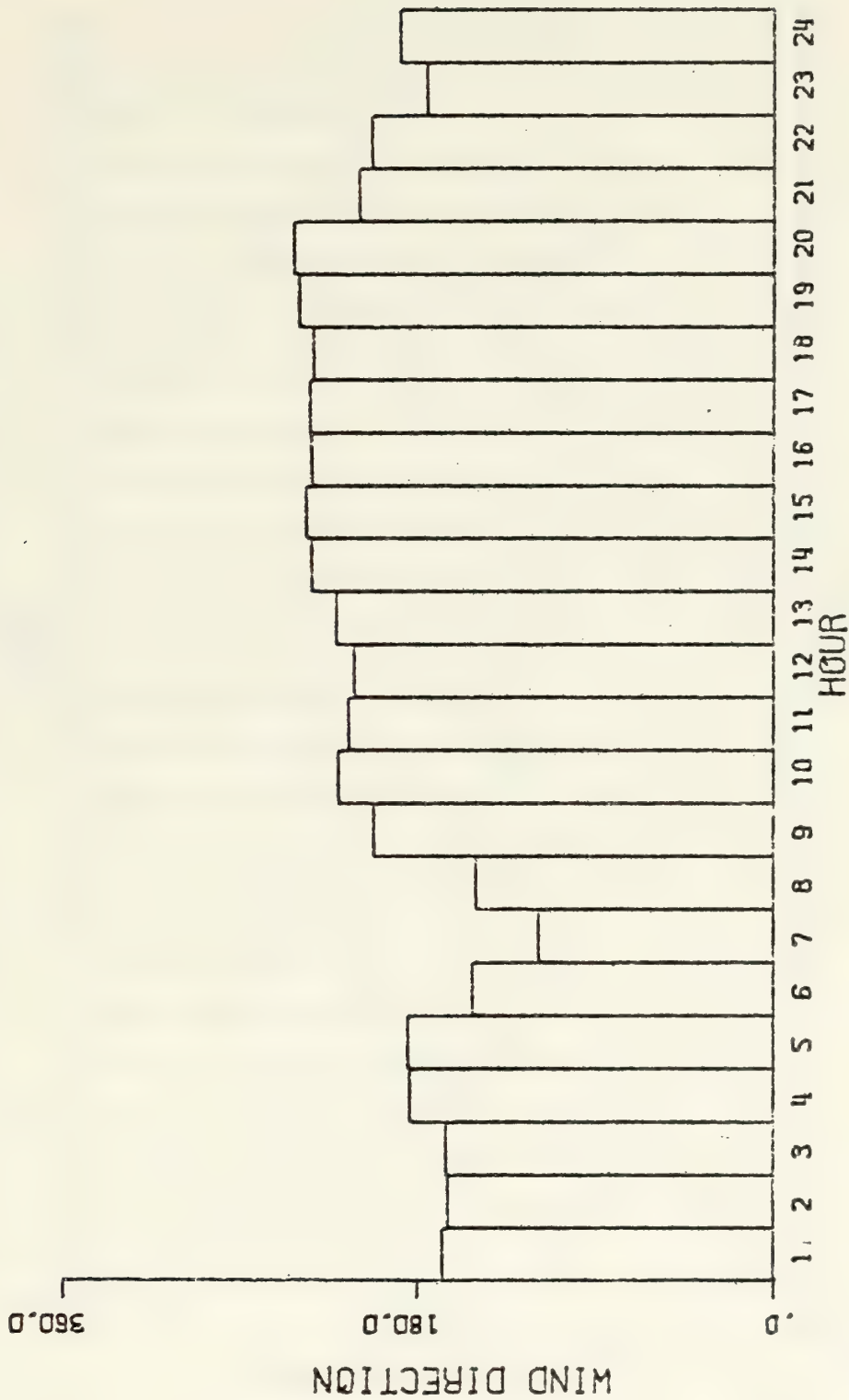




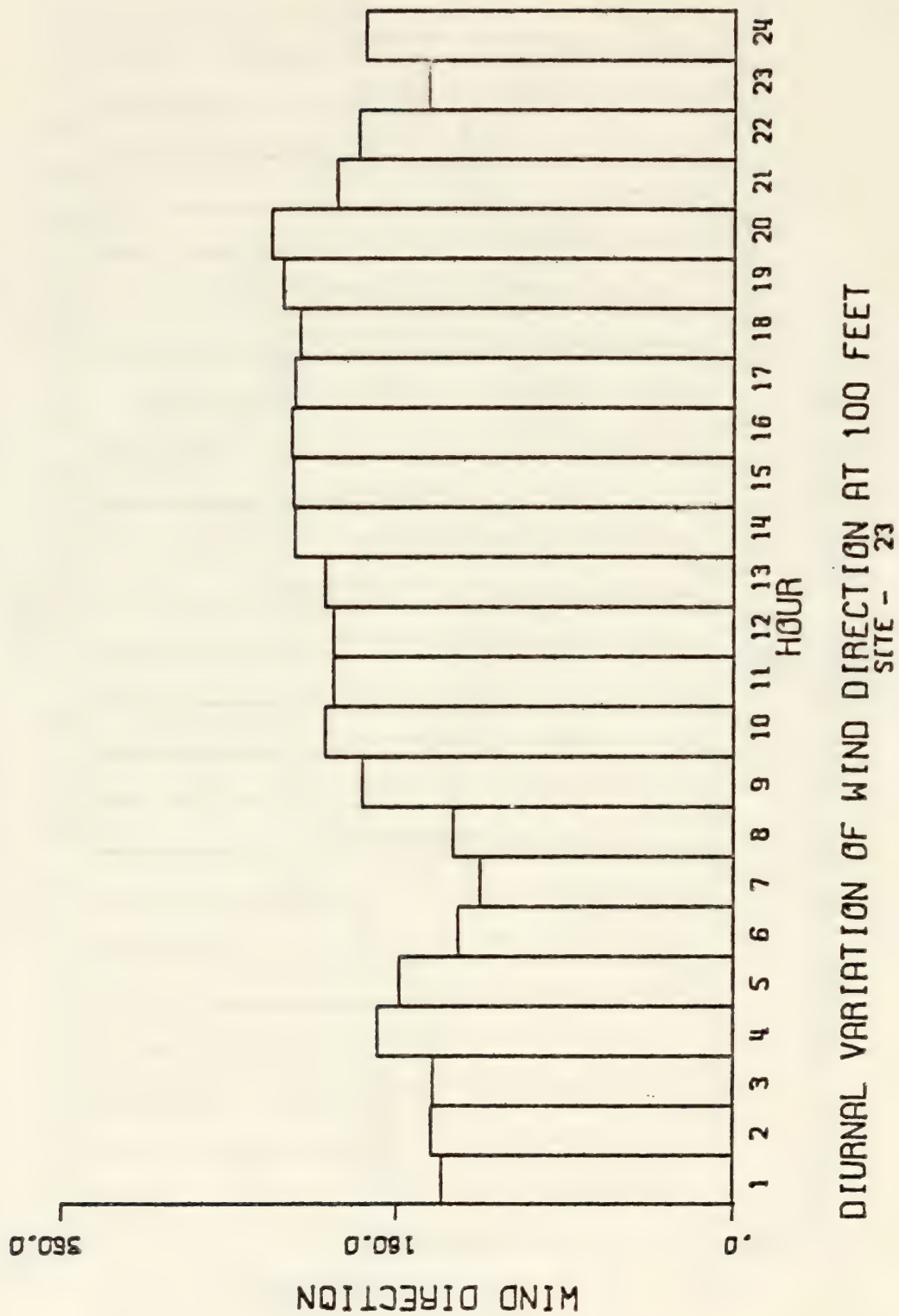
DIURNAL VARIATION OF WIND SPEED AT 200 FEET (MPH)
SITE - 23

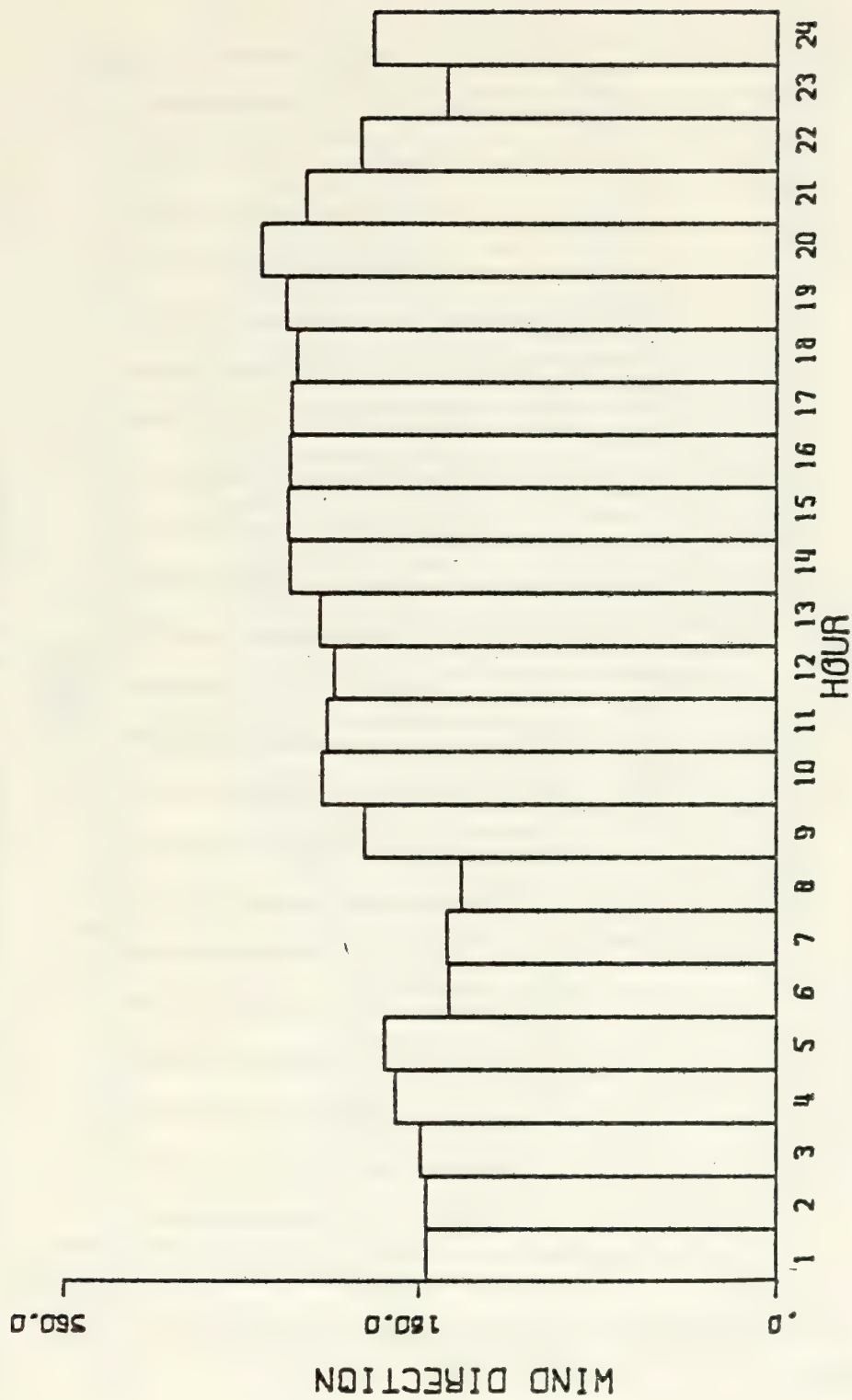


DIURNAL VARIATION OF WIND DIRECTION AT 8 FEET
SITE - 23

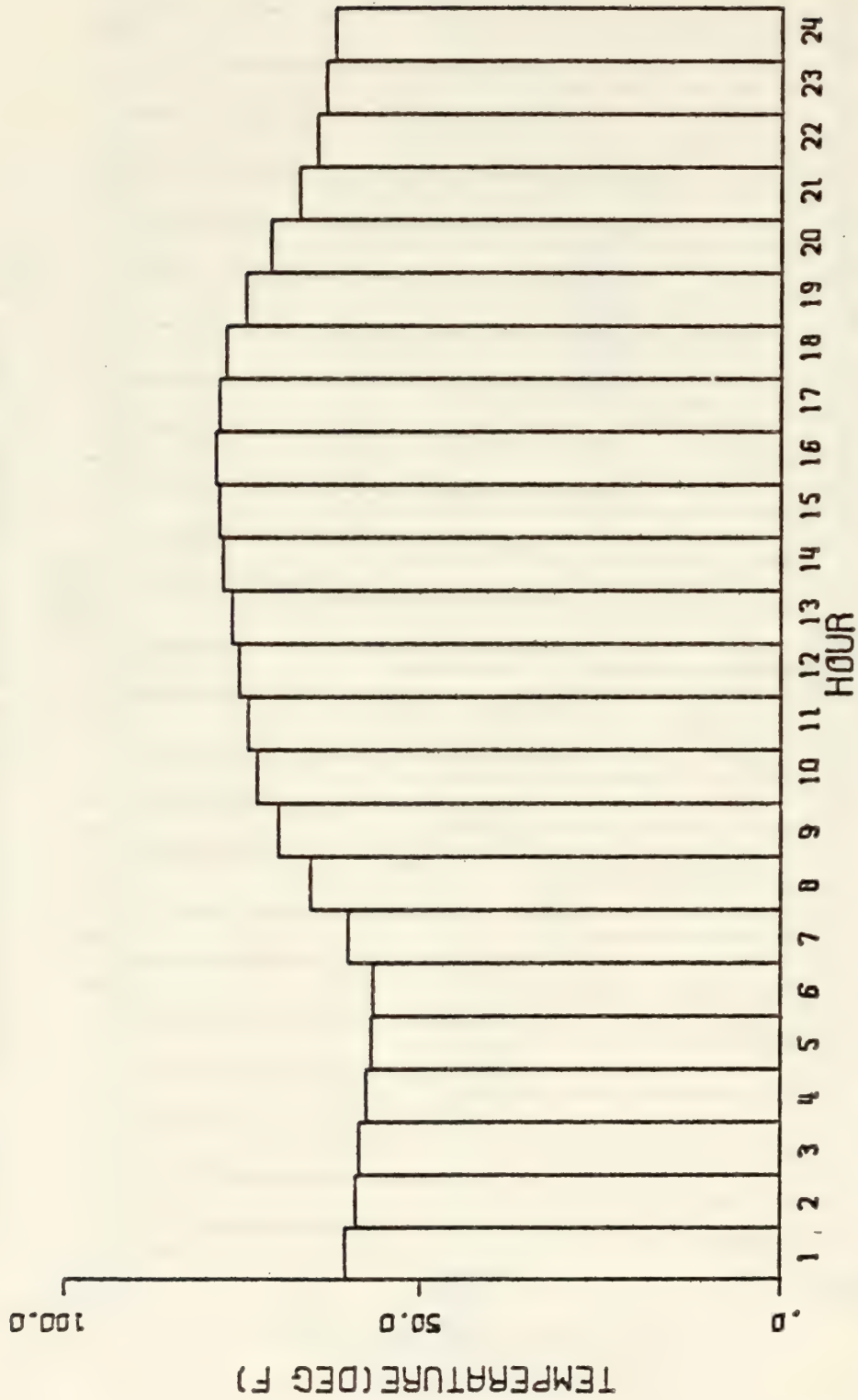


DIURNAL VARIATION OF WIND DIRECTION AT 30 FEET
SITE - 23

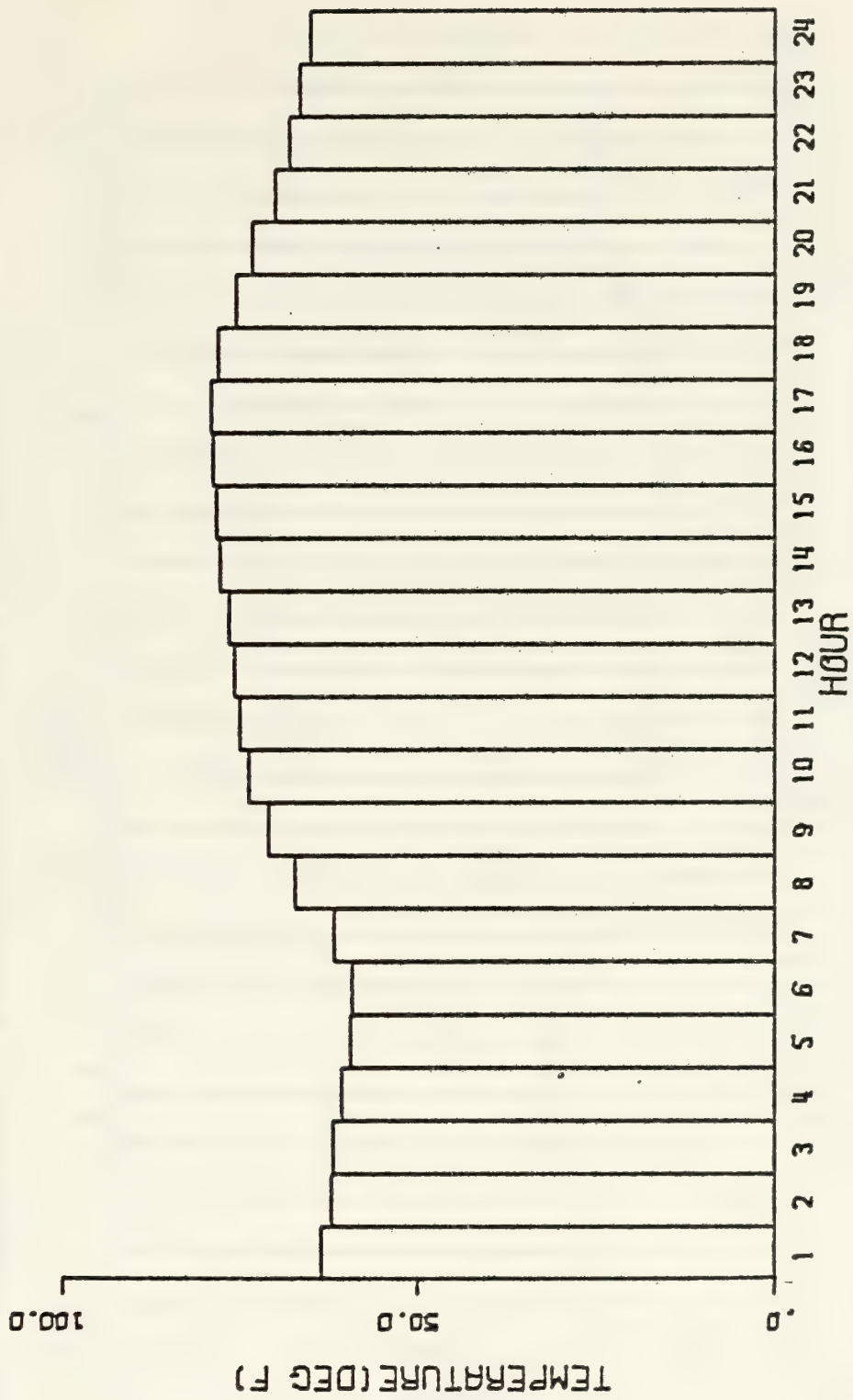




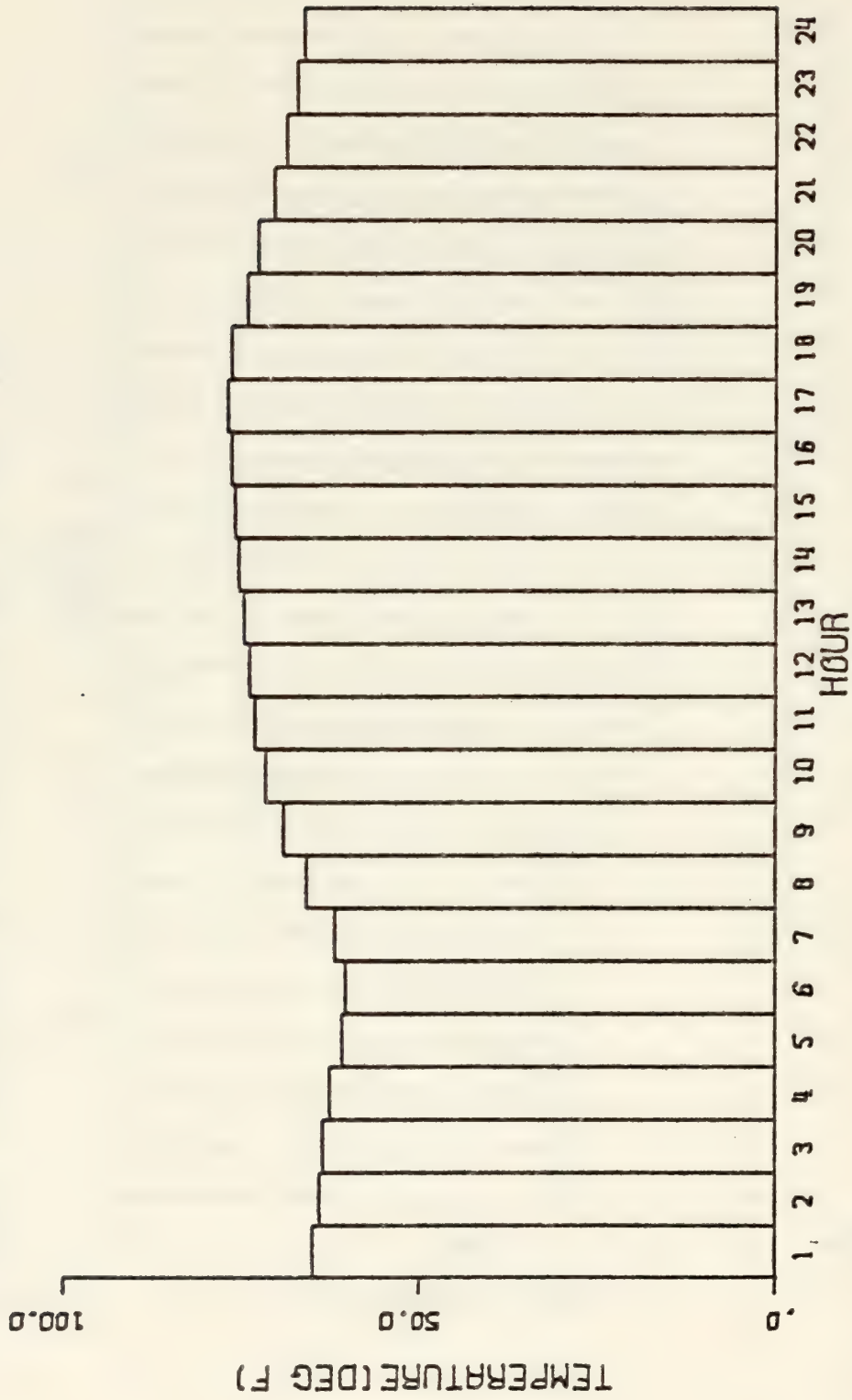
DIURNAL VARIATION OF WIND DIRECTION AT 200 FEET
SITE - 23



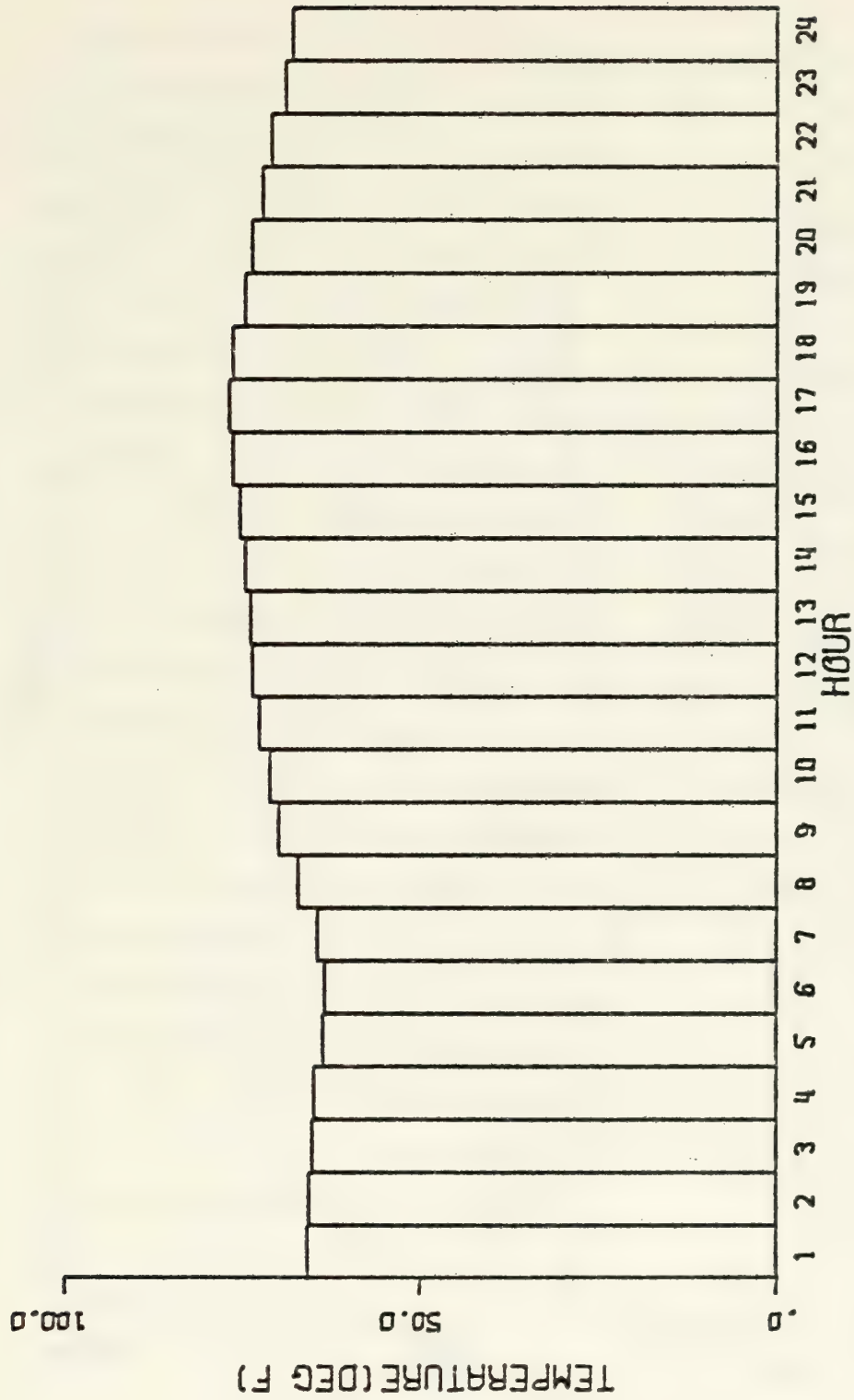
DIURNAL VARIATION OF TEMPERATURE AT 8 FEET (DEG F)
SITE - 23



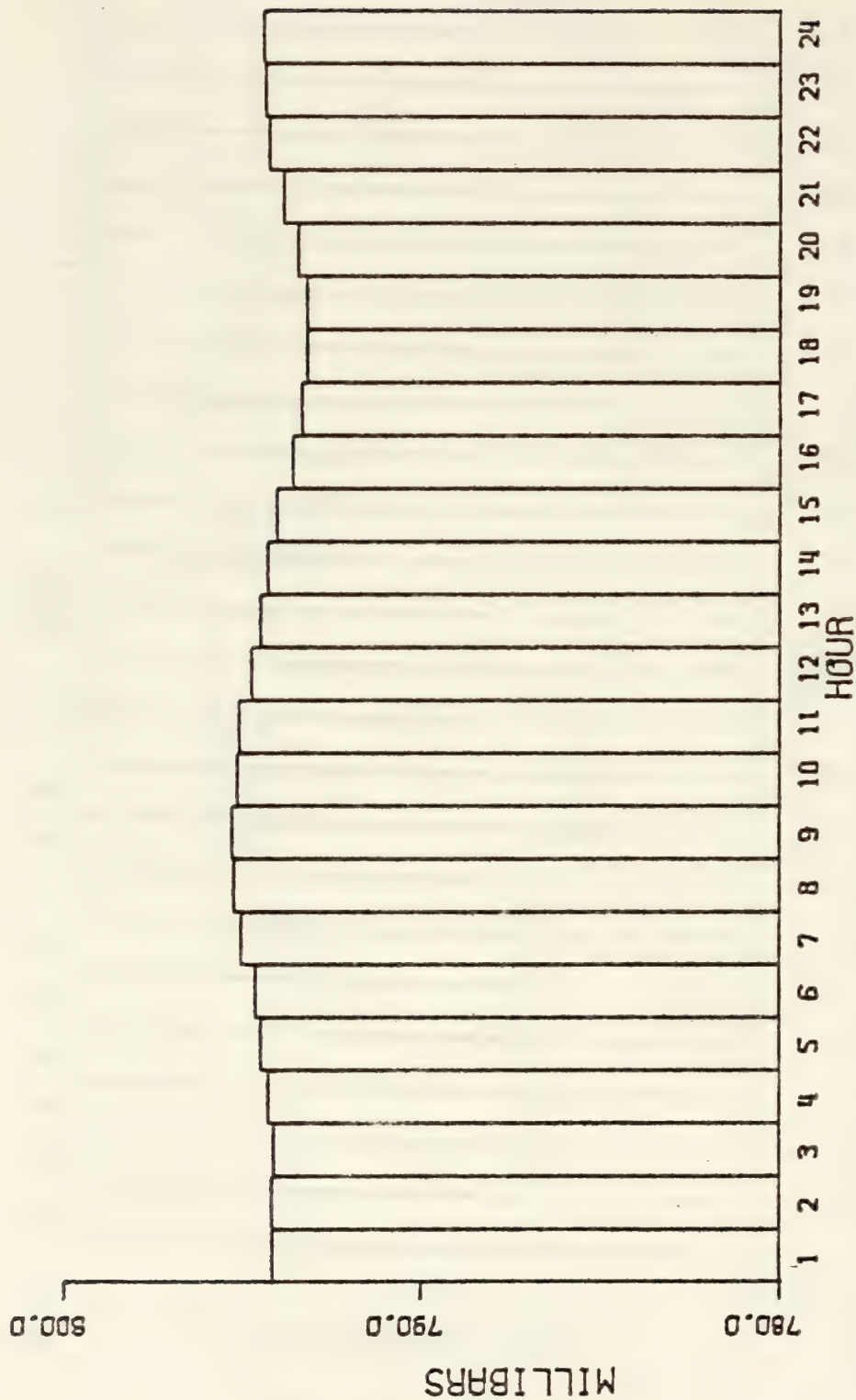
DIURNAL VARIATION OF TEMPERATURE AT 30 FEET (DEG F)
SITE - 23



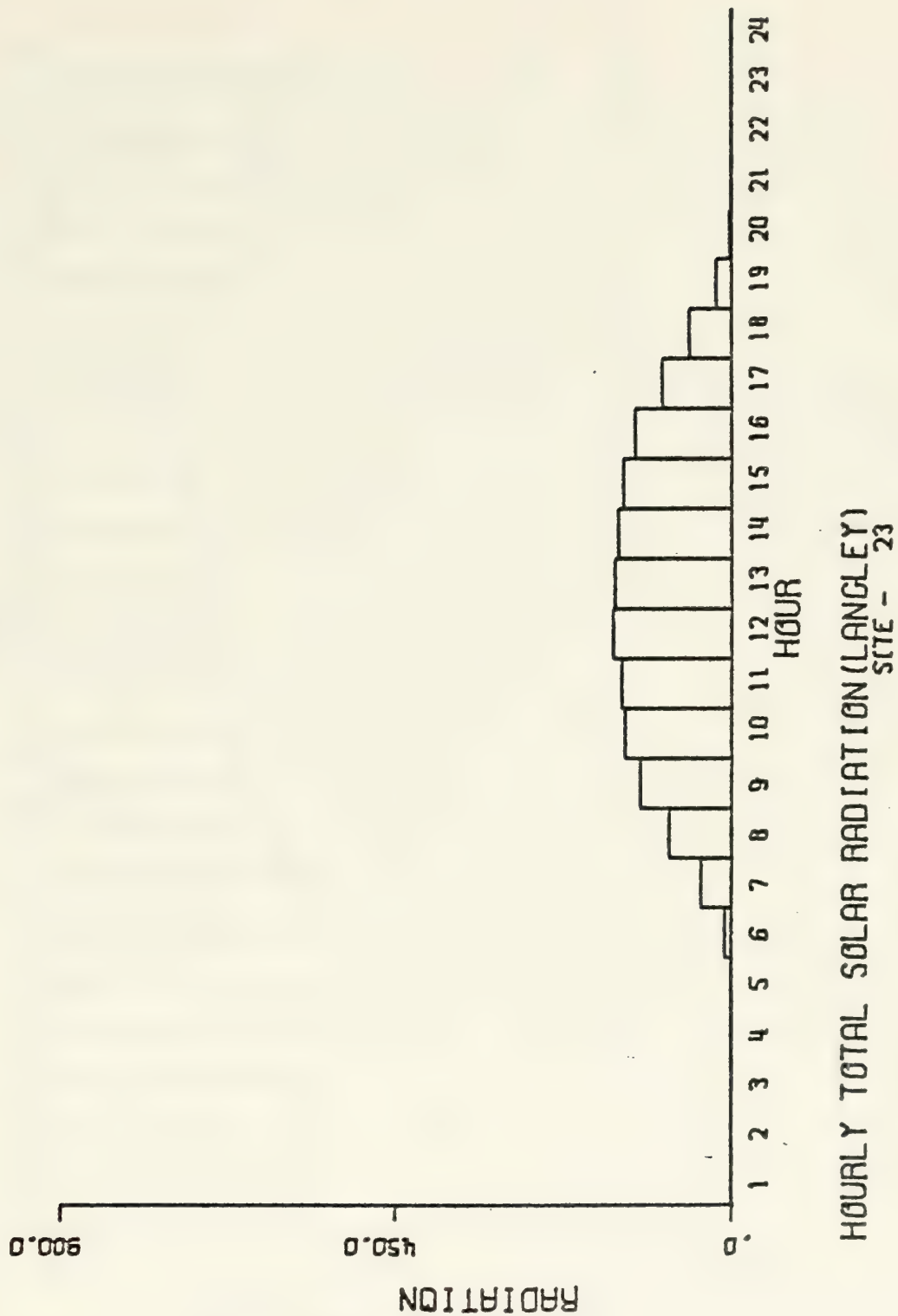
DIURNAL VARIATION OF TEMPERATURE AT 100 FEET (DEG F)
SITE - 23

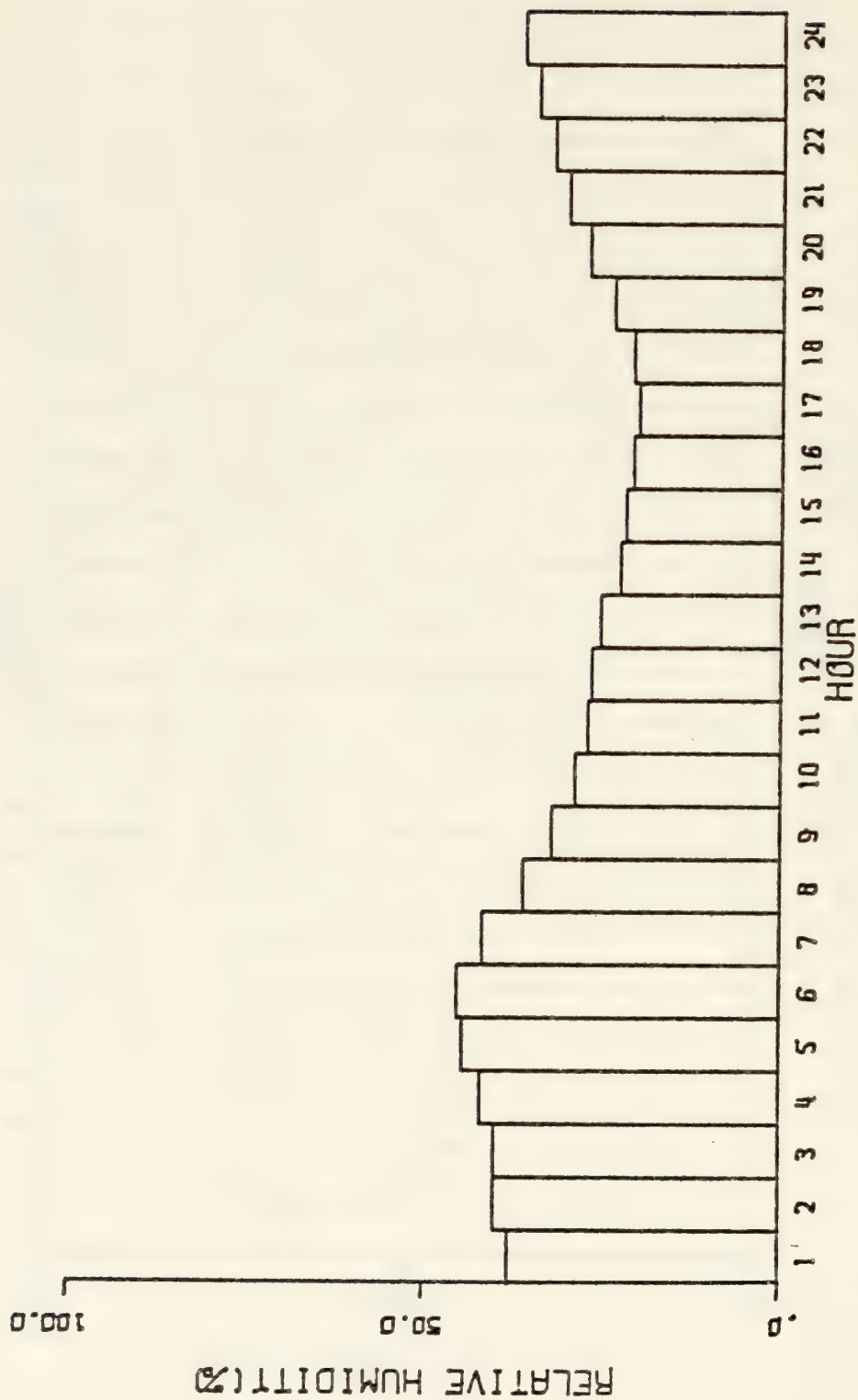


DIURNAL VARIATION OF TEMPERATURE AT 200 FEET (DEG F)
SITE -- 23



DIURNAL VARIATION OF BAROMETRIC PRESSURE
SITE - 23





DIURNAL VARIATION OF RELATIVE HUMIDITY AT 8 FEET
SITE - 23

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING PYRANOMETER RECORDING
PERIOD(7/ 1/76 TO 7/18/76)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
7/ 1						C	C	C	B	B	B	B	D	D	D	D	D	D	D					
7/ 2					D	D	C	D	D	D	D	D	D	D	C	C	D	D	D	D				
7/ 3					C	C	C	B	B	B	C	C	C	B	C	D	D	D	D	D				
7/ 4							C	C	C	D	D	D	C	D	D	D	D	D	D	D				
7/ 5					D	D	D	C	C	D	D	D	D	D	D	D	D	D	D	D				
7/ 6					D	D	D	C	C	C	D	D	C	B	C	C	C	C	D	D				
7/ 7					C	C	C	C	H	C	D	C	C	H	C	C	C	C	D	D				
7/ 8					C	C	C	H	C	C	C	H	C	C	D	D	D	D	D	D				
7/ 9					D	D	D	C	C	D	D	D	D	D	D	D	D	D	D	D				
7/10					D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D				
7/11					C	C	C	H	C	B	D	D	H	B	D	D	D	D	D	D				
7/12					C	C	C	H	D	D	D	D	D	B	D	D	D	C	D	D				
7/13					D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D				
7/14					C	C	D	C	C	D	D	C	C	D	C	C	D	D	D	D				
7/15					C	C	C	H	H	B	H	H	D	D	D	B	C	D	C	C	D			
7/16					D	D	D	B	C	C			D	C	C	C	C	C	C					
7/17					C	C	C	B	H	H	B	C	C	D	C	H	C	D	D	D				
7/18					D	D	C	C	C	C	C	B	H	D	C	D	D	D	D					

* NON-ZERO PYRANOMETER READING BUT STABILITY CLASS UNCERTAIN SINCE NIGHTTIME NET RADIATION INDEX IS REQUIRED

APPENDIX A
STABILITY WIND ROSE DIAGRAMS

APPENDIX A
STABILITY WIND ROSE DIAGRAMS

According to the data presented in AEC Safety Guide No. 23, the relationships between stability classes and σ_θ are as follows (the values shown are averages for each stability classification... σ_θ is the standard deviation of horizontal wind direction fluctuations).

<u>Stability Classification</u>	<u>Pasquill Categories</u>	<u>Average Values σ_θ (degrees)</u>
Extremely Unstable	A	25.0°
Moderately Unstable	B	20.0°
Slightly Unstable	C	15.0°
Neutral	D	10.0°
Slightly Stable	E	5.0°
Moderately Stable	F	2.5°

Stability wind roses obtained at the trailers in the monitoring network are displayed in the following tables. Because of the relatively low heights above the surface (9 meters) at which the wind data is taken, the stability distributions are skewed toward the unstable end of the spectrum. That is, the unstable classes (A, B, and C) have a much higher frequency of occurrence than would be obtained with the Pasquill method of stability categorization (or with instruments at higher levels).

Table 1 depicts the frequency distribution of Pasquill stability categories based on σ_θ from data collected by M. M. Pendergast and T. V. Crawford at the Savannah River Plant ("Actual Standard Deviations of Vertical and Horizontal Wind Direction Compared to Estimates from Other Measurements", Symposium on Atmospheric Diffusion and Air Pollution, September 9-13, 1974). Three distinct range patterns of stability class

distributions were observed: low, mid, and high, according to the height at which the σ_θ measurements were taken.

TABLE 1
FREQUENCY DISTRIBUTION OF PASQUILL STABILITY CATEGORIES

Height, ft	Stability Categories based on σ_z							
	A $\sigma_z > 23$	B $18 \leq \sigma_z < 23$	C $13 \leq \sigma_z < 18$	D $8 \leq \sigma_z < 13$	E $4 \leq \sigma_z < 8$	F $2 \leq \sigma_z < 4$	G $\sigma_z < 2$	
10	22.6	13.3	21.2	23.3	2.9	0.4	3.5	LOW RANGE
35	19.3	11.3	19.4	32.4	15.9	0.7	0.5	
91	9.6	6.7	13.5	21.7	29.6	15.4	2.5	MID RANGE
137	9.3	5.3	11.7	20.2	23.5	12.4	5.5	
182	7.0	2.9	6.6	17.1	25.9	25.6	14.7	HIGH RANGE
243	7.7	4.3	9.4	17.7	27.6	22.9	10.4	
304	7.2	3.7	8.0	17.2	23.7	23.9	11.3	

Also, Figure 1 (from D. H. Slade, Meteorology and Atomic Energy, 1968, p. 52) demonstrates that the line representing very stable conditions (which by their nature are associated with light winds) branches into three separate lines near the ground. The curve at the left represents the smallest values of σ_θ usually observed. The curve that branches off to the right reflects the contribution of very low-level wind direction meander to the total standard deviation. These meandering oscillations decrease in amplitude very rapidly with height under stable conditions. The central curve represents typical inversion conditions. Actually, for a given stability condition, values of σ_θ will always be greater when the wind is light than when it is strong. This phenomena is most noticeable in the lowest layers.

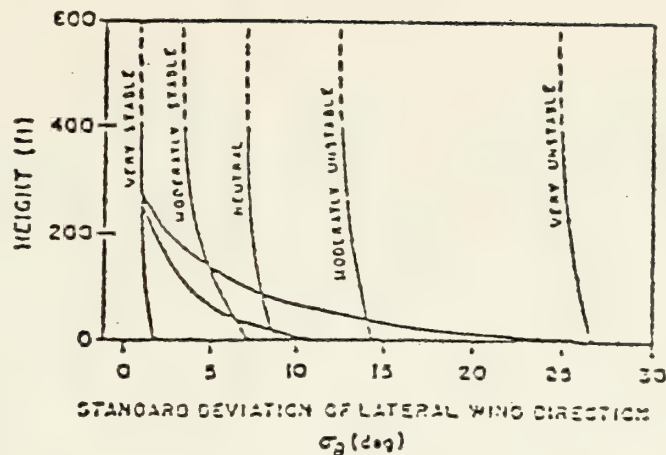


FIGURE 1

The vertical variation of the lateral wind-direction standard deviation (σ_{θ}) for various stability regimes. The curves represent average or typical conditions with the exception of the two outer "very stable" lines, which represent extremes.

The large surface values of σ_{θ} for unstable conditions do not decrease very rapidly with height. As in the case of very stable conditions, the greatest lateral fluctuations during a very unstable thermal structure occur with very light winds. As a general rule, for a given insolation condition, increasing wind speeds are associated with profiles of σ_{θ} that tend toward neutral stability.

The majority of the trailers in the network recorded very light winds throughout the month. Therefore, the stability distributions had a predominance of high σ_{θ} values and, hence, unstable classifications. Those trailers with the highest average winds (and fewest nearby obstacles to the flow) generally had the more reasonable and representative low-level stability class distributions.

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT

LEVEL = 8 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - A

GROUP MAX SPEED MPH		WIND DIRECTION																UNW	TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW				
GT	24	8	12	10	8	7	12	7	9	12	15	20	13	15	9	9	9	0.		
18 -	24											1						0.		
12 -	18		1				1						2	1				0.		
7 -	12	3	1	1	2	2	3	1	2	11	21	23	17	9	4	4	2	12.2.		
3 -	7	13	17	9	14	9	22	19	17	24	29	17	12	20	18	13	16	269.46.		
LT	3	10	11	23	12	25	19	14	8	14	5	7	9	9	6	13	10	195.55.		
TOTAL		26	30	33	28	36	45	34	27	50	57	52	40	39	28	30	28	583		
PERCENT		4.	5.	6.	5.	6.	8.	6.	5.	9.	10.	9.	7.	7.	5.	5.	5.	100.		

II B-2093

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 35(6.00 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 8 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - B

GROUP MAX SPEED MPH		WIND DIRECTION																NW	NNW	TOTAL
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
GT	24	:									1	1						:		
18 -	24	:																:		2
12 -	18	:								6	10	14	14					:		44
7 -	12	:	2	1	1	4	1	2	2	7	38	32	19	8	9	4	5	:		134
3 -	7	:	7	4	8	5	6	3	3	7	18	8	6	6	4	5	6	:		113
LT	3	:	0	5	3	6	6	3	2	4	6	5	0	2	3	2	2	:		53
TOTAL		:	9	10	16	12	12	10	7	24	73	60	39	16	16	11	13	:		346
PERCENT		:	3.	3.	5.	3.	3.	2.	7.	21.	17.	11.	5.	5.	5.	3.	4.	:		100

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 16(4.62 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 8 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - C

GROUP	MAX SPEED MPH	WIND DIRECTION																NNW	NW	TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
GT	24	10	8	13	9	9	10	15	13	21	20	27	19	16	16	21	12	:	:	1	0.
18 -	24									8	7	15	2			2		:	:	34	2.
12 -	18			1				1	5	21	116	144	28	10	6	6	1	:	:	339	23.
7 -	12	11	5	5	5	8	6	15	27	39	138	121	39	45	30	27	20	:	:	541	36.
3 -	7	19	22	19	17	26	32	25	34	33	40	28	23	27	30	27	14	:	:	416	28.
LT	3	1	6	10	11	15	10	19	15	19	20	16	10	8	8	1	4	:	:	173	12.
TOTAL		31	33	35	33	49	48	60	81	120	321	325	102	90	74	63	39	:	:	1504	
PERCENT		2.	2.	2.	2.	3.	3.	4.	5.	8.	21.	22.	7.	6.	5.	4.	3.	:	:	100.	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 19(1.26 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT

LEVEL = 8 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - D

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION								NNW	NW	TOTAL	%
	13	12	13	12	9	7	16	14	S	SSW	SW	WSW	W	WNW	NW	NNW				
GT 24 :									15	9	7	3		1			:			0
18 - 24 :									37	83	86	21	4	6	7	2	:		35	2
12 - 18 :	1	1	1	1			4	2	84	133	56	24	24	16	19	9	:		256	15
7 - 12 :	7	4	2	2	1	1	14	30	89	81	98	30	29	21	11	8	:		426	26
3 - 7 :	12	11	13	27	39	56	48	89	40	47	44	7	7	7	1	5	:		661	40
LT 3 :	8	3	6	13	22	19	18	28	40	47	44	7	7	7	1	5	:		275	17
TOTAL :	28	19	22	43	62	76	84	149	257	360	291	85	64	51	38	24	:		1653	
PERCENT :	2.	1.	1.	3.	4.	5.	5.	9.	16.	22.	18.	5.	4.	3.	2.	1.	:		100	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 21(1.27 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 8 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - E

GROUP	MAX SPEED MPH	WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
18 -	24	13	3	6	4	5	4	11	13	21	18	18	20	16	16	17	12		
12 -	18									4	1	3	2					10	1
7 -	12	1							2	9	21	19	2	4	3	10	1	72	7
3 -	7	6						7	2	40	48	19	9	4	8	20	11	174	18
LT	3	18	2	4	4	8	22	24	29	62	60	153	26	14	18	19	20	483	49
TOTAL		39	7	13	6	22	35	49	56	142	164	242	48	27	39	55	42	247	25
PERCENT		4.	1.	1.	1.	2.	4.	5.	6.	14.	17.	25.	5.	3.	4.	6.	4.	100	
.....																			
TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -																			
19(1.93 %)																			

STABILITY WIND ROSE DIAGRAM

C-8 SHALE OIL PROJECT
LEVEL = 8 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - TOTAL

GROUP	MAX SPEED MPH	WIND DIRECTION																TOTAL
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
GT	24	13	12	13	12	10	12	16	14	22	20	27	20	16	23	21	12	2
18 -	24									27	18	27	7		1	2		82
12 -	18	2	2	2	1		1	5	9	74	232	267	67	19	15	23	4	723
7 -	12	29	11	8	10	12	14	38	63	181	378	251	108	90	67	74	47	1381
3 -	7	69	56	57	70	87	140	122	172	207	235	304	97	96	91	75	64	1942
LT	3	35	31	53	43	83	68	74	80	107	115	125	38	32	36	25	33	978
TOTAL		135	100	120	124	182	223	239	324	596	978	975	317	237	210	199	148	5107
PERCENT		3.	2.	2.	2.	4.	4.	5.	6.	12.	19.	19.	6.	5.	4.	4.	3.	100

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 110(2.15 %)

PERCENTAGE OF A	STABILITY -	11.42 %
PERCENTAGE OF B	STABILITY -	6.78 %
PERCENTAGE OF C	STABILITY -	29.45 %
PERCENTAGE OF D	STABILITY -	32.37 %
PERCENTAGE OF E	STABILITY -	19.31 %

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 30 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - A

GROUP	MAX SPEED MPH	WIND DIRECTION																NNW	NW	TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
GT	24	:																		:	0
18 -	24	:									1									:	1 0
12 -	18	:								1	2	1	4	1		1				:	10 5
7 -	12	:	2	2	2	1	2	2	3	17	14	11	8	3	3	3	3	3	3	:	76 22
3 -	7	:	17	13	9	9	15	16	21	15	6	13	10	19	14	10	6	6	6	:	203 58
LT	3	:	2	2	4	12	7	2	0	2	4	3	3	7	4	3	2	2	2	:	60 17
TOTAL		:	21	17	15	21	23	20	23	21	29	32	28	29	21	17	11	11	11	:	350
PERCENT		:	6.	5.	4.	6.	7.	6.	7.	6.	8.	9.	8.	8.	6.	5.	3.	3.	3.	:	100

.....
TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 1(0.29 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 30 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - B

GROUP	MAX SPEED MPH	WIND DIRECTION																TOTAL	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
GT	24	:															:	0	
18 -	24	:										2					:	2 1	
12 -	18	:								2	4	10	6	1			:	23 15	
7 -	12	:	1	1	1	1		3	5	10	8	8	3	7	4	5	4	:	61 35
3 -	7	:	5	4	7	8	7	3	2	8	3	4	6	5	4	2	4	:	75 44
LT	3	:	0	1	1	1	0	0	0	0	1	0	0	1	1	0	0	:	11 6
TOTAL		:	6	6	9	10	7	6	7	20	16	24	15	14	9	7	8	:	172
PERCENT		:	3.	3.	5.	6.	4.	3.	4.	12.	9.	14.	9.	8.	5.	4.	5.	:	100

	TOTAL NUMBER OF CALMS DISTRIBUTED	ABOVE -	(0.58 %)
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STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT

LEVEL = 30 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - C

GROUP MAX SPEED NPH		WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NNW	NNW		
GT 24	:	13	9	5	13	14	10	20	12	18	23	25	24	13	29	19	14	:	3 0.
18 - 24	:							1		3	24	25	6		3	1		:	63 8.
12 - 18	:	1			1	2		2	1	18	88	73	15	2	9	3	1	:	216 28.
7 - 12	:	10	2		1	9	5	11	2	16	51	32	21	17	17	14	14	:	222 29.
3 - 7	:	14	16	14	11	21	14	14	20	13	17	11	7	11	17	10	10	:	220 28.
LT 3	:	2	1	3	3	5	4	2	3	2	7	4	4	4	3	1	3	:	51 7.
TOTAL	:	27	19	17	16	37	23	30	26	52	187	146	54	34	50	29	28	:	775
PERCENT	:	3.	2.	2.	2.	5.	3.	4.	3.	7.	24.	19.	7.	4.	6.	4.	4.	:	100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 4(0.52 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 30 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - D

GROUP	MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION								NW	NNW	TOTAL	%	
									SSE	S	SSW	SW	WSW	W	WNW						
GT	24	:							4	3	7	1		2			:	17	1.		
18 -	24	:						1	6	32	44	42	7	2	6	3	:	143	9.		
12 -	18	:		6	2	3	2	7	18	60	186	112	23	21	15	7	4	:	468	30.	
7 -	12	:	10	10	2	6	5	17	21	32	41	90	43	29	41	20	21	17	:	405	26.
3 -	7	:	18	13	17	25	42	33	22	40	53	62	48	20	22	19	9	7	:	450	29.
LT	3	:	2	1	6	0	6	4	5	8	9	7	9	5	4	1	2	1	:	70	5.
TOTAL		:	32	24	31	33	56	56	56	104	199	392	261	85	90	63	42	29	:	1553	
PERCENT		:	2.	2.	2.	4.	4.	4.	7.	13.	25.	17.	5.	6.	4.	3.	2.	:		100.	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 4(0.26 %)

STABILITY WIND ROSE DIAGRAM

C-H SHALE OIL PROJECT
LEVEL = 30 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - E

GROUP	MAX SPEED MPH	WIND DIRECTION																NNW	NW	TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW				
GT	24	16	7	18	11	14	14	22	20	27	35	27	26	18	23	20	16				
										12	5	2	1								
18 -	24			1				2	2	47	37	41	7	2	10	3					
12 -	18			2			2	21	30	79	119	78	27	9	16	14	8				
7 -	12		1	8	13	10	25	48	151	74	127	44	41	32	23	31	23				
3 -	7		14	16	25	80	58	60	73	70	116	100	26	32	20	24	27				
LT	3		5	0	3	6	6	3	15	18	18	10	6	1	4	3	6				
TOTAL		63	20	27	41	99	91	134	271	300	422	275	108	76	73	75	64				
PERCENT		3.	1.	1.	2.	5.	4.	6.	13.	14.	20.	15.	5.	4.	3.	4.	3.				

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 4(0.19 %)

STABILITY WIND ROSE DIAGRAM

C-H SHALE OIL PROJECT

LEVEL = 30 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - TOTAL

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION								NNW	NW	TOTAL
									S	SSW	SW	WSW	W	WNW	NW	NNW			
GT 24 :	16	11	18	13	14	14	22	22	27	35	28	26	22	29	22	16			
18 - 24 :			1				4	8	82	106	110	20	4	19	7				
12 - 18 :	7		8	3	8	4	30	50	161	398	277	72	33	40	25	13	13	1129	25
7 - 12 :	41	16	13	21	25	52	82	193	158	290	138	102	100	67	74	61	1433	29	
3 - 7 :	89	60	63	78	165	124	120	150	150	211	173	69	89	74	55	54	1724	35	
LT 3 :	12	10	14	19	25	16	15	29	34	37	27	18	17	13	9	12	307	6	
TOTAL :	149	86	99	121	223	196	251	430	601	1050	735	284	243	216	170	140	4994		
PERCENT :	3.	2.	2.	2.	4.	4.	5.	9.	12.	21.	15.	6.	5.	4.	3.	3.	100		

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 140 0.28 %

PERCENTAGE OF A	STABILITY -	7.01 %
PERCENTAGE OF B	STABILITY -	3.44 %
PERCENTAGE OF C	STABILITY -	15.52 %
PERCENTAGE OF D	STABILITY -	31.10 %
PERCENTAGE OF E	STABILITY -	42.83 %

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 100 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - A

GROUP	MAX SPEED NPH	WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
GT	24	:																:	0
18 -	24	:									2							:	1
12 -	18	:	1						1	2	0	2	1			2	1	:	10
7 -	12	:	1		2	4	1	2	4	6	9	7	3	4	3	5	2	:	53
3 -	7	:	10	11	12	15	10	16	20	16	15	11	10	8	6	7	4	:	184
LT	3	:	4	3	12	2	10	7	4	5	8	8	6	9	4	2	5	:	96
TOTAL		:	16	14	26	21	20	24	26	26	30	28	20	21	13	16	12	:	345
PERCENT		:	5.	4.	8.	6.	6.	7.	8.	9.	9.	8.	6.	6.	4.	5.	3.	:	100

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TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 30 0.87 %

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 100 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - B

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION								NNW	NW	TOTAL
								SSE	S	SSW	SW	WSW	W	WNW				
GT 24 :	10	7	4	6	6	10	9	10	14	16	22	19	13	10	12	8	0	
18 - 24 :										3	1						4 2	
12 - 18 :									4	3	6	2	1		1		17 10	
7 - 12 :	2	1				2	1	3	4	13	9	7	3	4	1	3	53 32	
3 - 7 :	2	7	2	6	8	5	6	3	2	6	1	2	4	7	6	1	68 40	
LT 3 :	3	1	2	2	5	0	2	1	0	1	1	1	2	3	1	1	26 15	
TOTAL :	7	9	4	8	13	7	9	7	10	23	20	13	10	14	9	5	168	
PERCENT :	4.	5.	2.	5.	8.	4.	5.	4.	6.	14.	12.	8.	6.	8.	5.	3.	100	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 20 (1.19 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 100 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - C

GROUP MAX SPEED MPH	WIND DIRECTION																NNW	NW	WNW	W	WSW	SW	SSW	S	SSE	SE	ESE	E	ENE	NE	NNE	N	TOTAL	%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 2(0.33 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 100 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - D

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION								W	WNW	NW	NNW	TOTAL	%
	14	12	16	14	14	16	24	SSE	S	SSW	SW	WSW	29	33	29	21	25	22	20		
GT 24 :							1		15	18	20	3			2					59	4
18 - 24 :							0	5	36	99	74	10			7	2		7	1	241	17
12 - 18 :	2	1	3	3	8	2	12	15	56	178	89	31			20	20		13	8	461	52
7 - 12 :	13	8	4	3	16	17	19	30	33	44	31	26			31	26		30	20	351	24
3 - 7 :	10	10	11	20	29	28	27	11	22	17	17	17			12	12		15	16	274	19
LT 3 :	2	1	5	7	5	4	6	4	7	5	7	3			3	9		2	2	72	5
TOTAL :	27	20	23	33	58	51	65	65	169	361	238	90			75	69		67	47	1458	
PERCENT :	2.	1.	2.	2.	4.	3.	4.	4.	12.	25.	16.	6.			5.	5.		5.	3.	100	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 4(0.27 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 100 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - E		WIND DIRECTION																TOTAL	%
GROUP	MAX SPEED	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNNW	NW	NNW		
	MPH	18	9	21	12	15	15	25	26	30	28	31	29	23	31	26	19		
GT	24	:						3	1	31	16	20	6		5	2	:	84	
18 -	24	:		2				1	16	78	103	81	15	4	11	4	2	318	
12 -	18	:	7	5	1	4	9	64	86	107	156	82	42	28	22	9	13	635	
7 -	12	:	22	3	5	32	83	71	95	67	99	31	40	45	26	37	27	695	
3 -	7	:	28	15	20	37	62	77	55	47	53	30	27	25	19	28	17	536	
LT	3	:	6	7	10	3	10	8	15	12	7	5	5	8	3	11	8	122	
TOTAL		:	64	25	42	83	162	231	245	334	434	249	135	110	86	91	67	2390	
PERCENT		:	3.	1.	2.	3.	7.	10.	10.	14.	18.	10.	6.	5.	4.	4.	3.	100.	

II B-2109

.....
TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 18(0.75 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 100 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - TOTAL

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION								NW	NNW	TOTAL	%
								SSE	S	SSW	SW	WSW	W	WNW					
GT 24 :							4	1	46	36	41	9		9	2			148	3
18 - 24 :	1		2				1	21	122	218	179	30	7	19	11		3	614	12
12 - 18 :	10	1	8	4	12	13	78	105	179	391	224	89	57	48	33		25	1277	26
7 - 12 :	42	16	15	23	51	109	98	138	119	191	96	90	96	76	81		66	1307	26
3 - 7 :	67	62	55	72	96	131	140	82	98	99	69	64	62	56	66		44	1263	25
LT 3 :	17	15	34	15	35	26	31	28	20	27	26	18	31	16	21		18	378	8
TOTAL :	137	94	114	114	194	279	352	375	584	962	635	300	253	224	214		156	4987	
PERCENT :	3.	2.	2.	2.	4.	6.	7.	8.	12.	19.	13.	6.	5.	4.	4.		3.	100	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 290 0.58 %

PERCENTAGE OF A	STABILITY -	6.92 %
PERCENTAGE OF B	STABILITY -	3.37 %
PERCENTAGE OF C	STABILITY -	12.27 %
PERCENTAGE OF D	STABILITY -	29.24 %
PERCENTAGE OF E	STABILITY -	47.92 %

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 200 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - A

GROUP	MAX SPEED	NPH	WIND DIRECTION																	TOTAL	4
			N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
GT	24	:	13	6	9	7	8	12	15	9	15	21	12	12	7	8	12	13	:	0.	
18 -	24	:										1							:	1 0.	
12 -	18	:	1		2	1	1	1	1		1	1	1	1			2	1	:	10 3.	
7 -	12	:	1		2	2	1	0	2	4	3	10	4	8	4	2	1	1	:	45 13.	
3 -	7	:	10	14	9	11	10	11	23	14	14	13	10	4	9	11	9	7	:	179 53.	
LT	3	:	6	8	6	10	5	8	8	7	8	10	7	2	4	4	6	2	:	101 30.	
TOTAL		:	18	22	17	23	16	20	34	25	26	35	22	15	17	17	18	11	:	336	
PERCENT		:	5.	7.	5.	7.	5.	6.	10.	7.	8.	10.	7.	4.	5.	5.	5.	3.	:	100.	

II B-2111

.....
TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 14(4.17 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL =200 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - B

GROUP	MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION								NW	NNW	TOTAL	%
										S	SSW	SW	WSW	W	WNW	NW	NNW				
GT	24	:								1								:			0.
18 -	24	:								1								:			2 1.
12 -	18	:								3	1	6	5	3				2 :			22 13.
7 -	12	:	1		2			3	1	2	6	13	4	2	2	3		1 :			40 24.
3 -	7	:	4	5	4	4	5	4	14	7	2	5	2	4	3	5	5	5 :			77 47.
LT	3	:	0	2	1	3	1	1	0	2	1	4	2	3	1	0	1	1 :			24 15.
TOTAL		:	5	7	5	8	7	6	10	15	10	28	14	12	6	8	9	9 :			165
PERCENT		:	3.	4.	3.	5.	4.	4.	6.	9.	9.	17.	8.	7.	4.	5.	5.	5. :			100.

.....
TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 3(1.82 %)

STABILITY WIND ROSE DIAGRAM

C-8 SHALE OIL PROJECT
LEVEL =200 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - C

GROUP	MAX SPEED MPH	WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
GT	24	:							1	6	2				1			:	10 2.
18 -	24	:							2	15	24	13	3	2	2			:	61 10.
12 -	18	:					1		2	6	33	44	17	8	8	7	4	:	130 22.
7 -	12	:	5	7	3	3	8	2	6	15	25	26	14	8	19	14	10	:	165 26.
3 -	7	:	9	13	7	11	9	17	15	16	8	17	13	8	8	13	15	:	187 32.
LT	3	:	0	3	0	5	3	1	3	2	4	2	3	2	3	1	0	:	36 6.
TOTAL		:	14	23	10	19	12	27	20	26	35	93	116	56	41	57	27	:	589
PERCENT		:	2.	4.	2.	3.	2.	5.	3.	4.	6.	16.	20.	10.	7.	6.	5.	:	100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 7(1.19 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL =200 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - D

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION								WNW	NW	NNW	TOTAL
								SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
GT 24 :	15	11	12	15	14	12	27	23	32	30	44	29	22	24	29	21			
18 - 24 :							2	3	17	95	99	33	8	4	4	1			
12 - 18 :	3	1	3	3	10	1	5	11	23	118	108	40	25	14	11	9			91
7 - 12 :	11	8	3	3	8	19	23	20	36	48	31	26	34	29	36	16			266
3 - 7 :	15	6	8	7	10	28	21	28	19	15	22	17	9	16	13	14			382
LT 3 :	4	1	3	10	3	6	4	5	2	7	6	11	3	4	5	2			351
TOTAL :	33	15	15	23	31	54	56	67	105	303	314	138	79	68	71	42			248
PERCENT :	2.	1.	1.	2.	2.	4.	4.	5.	7.	21.	22.	10.	6.	5.	5.	3.			100

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 6(0.42 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 200 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - E

GROUP MAX SPEED MPH		WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSL	S	SSW	SW	WSW	W	WNW	NW	NNW		
GT	24	10	13	22	14	14	17	27	26	32	36	38	32	23	27	32	20	175	7.
18 -	24	2		2				6	24	58	156	164	24	13	13	9	2	473	19.
12 -	18	7	1	6	3	3	23	52	79	59	122	125	42	28	27	18	18	613	25.
7 -	12	22	8	6	11	11	46	68	71	50	47	44	24	41	48	39	39	575	24.
3 -	7	31	24	19	9	14	59	63	27	24	31	41	18	16	27	19	17	439	18.
LT	3	8	10	6	7	11	14	15	7	17	12	3	7	4	9	11	10	151	6.
TOTAL		70	43	39	30	39	142	207	210	230	439	436	123	102	127	103	86	2426	
PERCENT		3.	2.	2.	1.	2.	6.	9.	9.	9.	18.	18.	5.	4.	5.	4.	4.	100.	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 24(0.99 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT

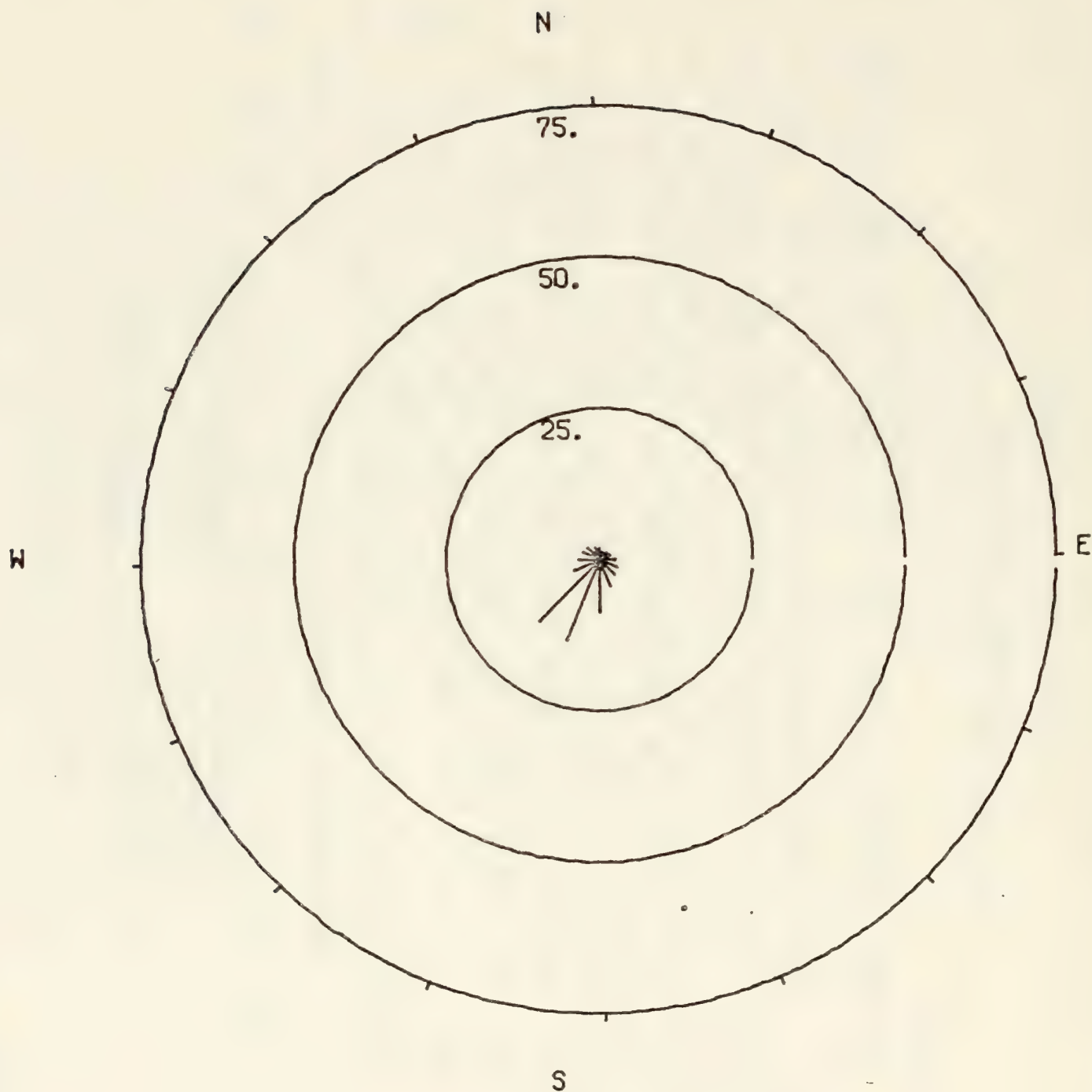
LEVEL =200 FEET PERIOD(7/ 1/77 TO 7/18/77)

STABILITY CLASS - TOTAL

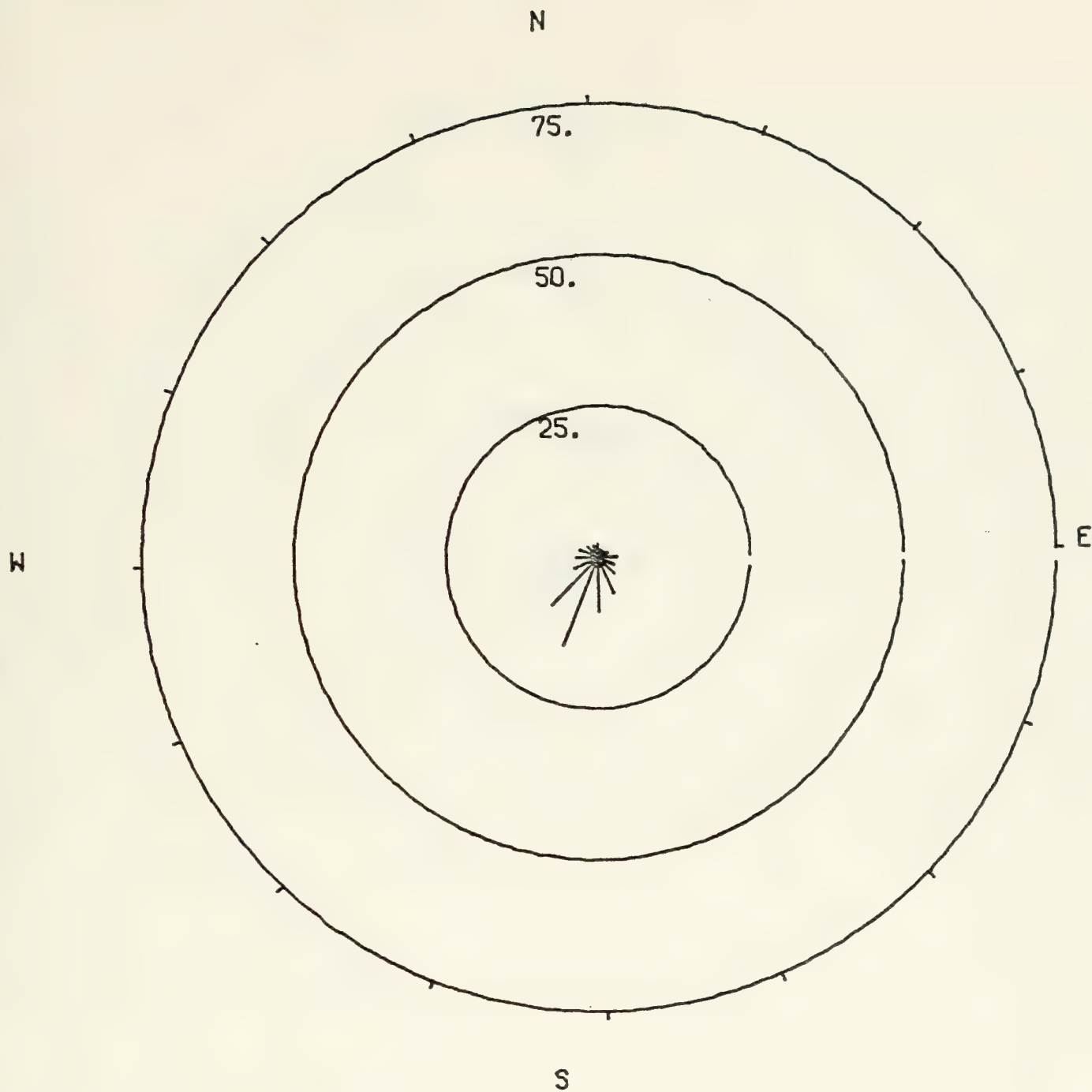
GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION								NW	NNW	TOTAL
	18	13	22	15	14	17	27	26	SSW	SW	WSW	W	WNW	NW	NW	NW			
GT 24 :							4	2	30	92	113	21	5	9			276		
18 - 24 :	2		2				8	27	78	267	207	71	19	15			3		803
12 - 18 :	11	1	7	6	13	26	60	92	92	275	284	105	49	38			34		1157
7 - 12 :	40	23	14	21	20	73	98	102	106	136	118	76	100	93			67		1176
3 - 7 :	69	62	47	42	47	120	126	99	72	78	91	49	65	59			56		1130
LT 3 :	20	25	17	35	26	33	32	23	34	33	26	25	23	24			16		412
TOTAL :	142	111	87	104	106	252	328	345	412	881	919	347	245	238			176		4954
PERCENT :	3.	2.	2.	2.	2.	5.	7.	7.	8.	18.	19.	7.	5.	5.			4.		100

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 540 (1.09 %)

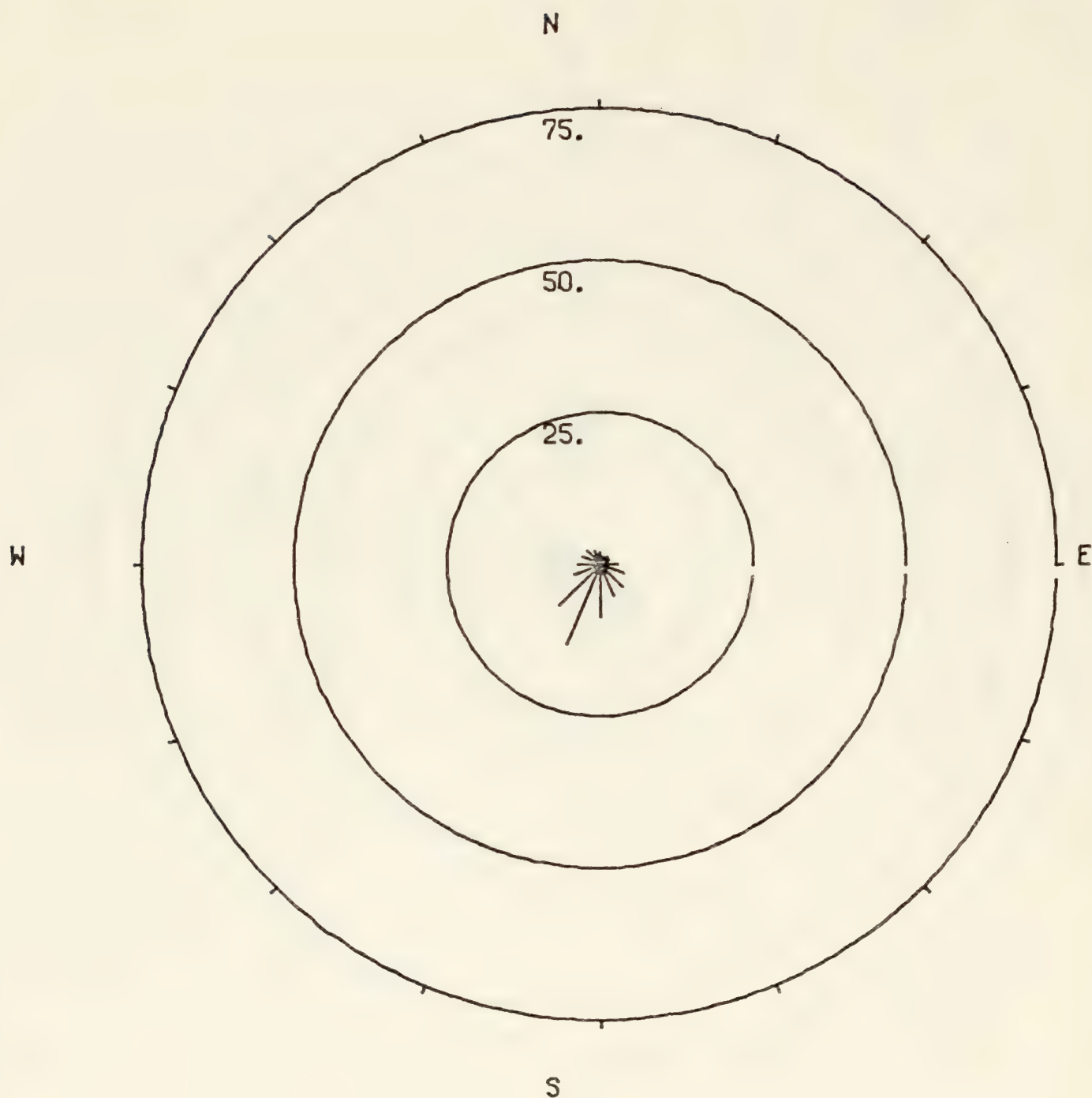
PERCENTAGE OF A	STABILITY -	6.78 %
PERCENTAGE OF B	STABILITY -	3.33 %
PERCENTAGE OF C	STABILITY -	11.89 %
PERCENTAGE OF D	STABILITY -	28.54 %
PERCENTAGE OF E	STABILITY -	48.97 %



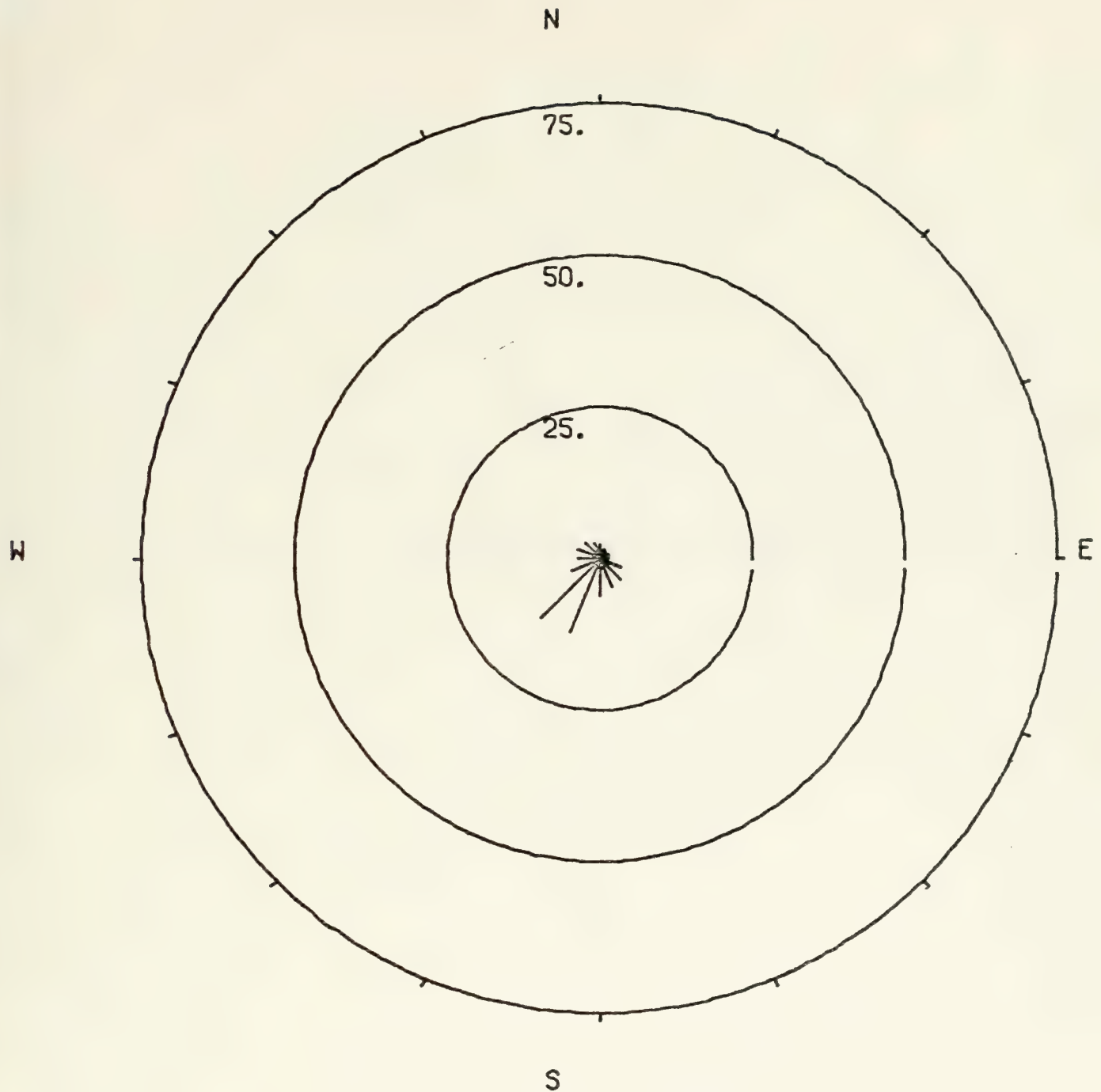
PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 8 FOOT LEVEL



PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 30 FOOT LEVEL



PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 100 FOOT LEVEL



PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 200 FOOT LEVEL

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RADIAN

CORPORATION

DCN 77-100-484-7-171-94
(100-152)

AIR MONITORING REPORT
FOR
C-b SHALE OIL PROJECT
AUGUST 1977
Report No. 36

19 October 1977

Presented to:
C-b Shale Oil Project
United Bank Tower
Denver, Colorado 80202

Prepared by:
Radian Staff

II B-2121

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I. GENERAL DESCRIPTION OF AIR MONITORING PROGRAM

Radian Corporation, under contract to the C-b Oil Shale Project, is performing the data compilation and reporting of air quality and meteorological data at one monitoring site in Northwest Colorado. The site measures and records concentrations of particulates, sulfur dioxide, oxides of nitrogen, hydrogen sulfide, total hydrocarbons, methane, and carbon monoxide. A 200-foot meteorological tower provides wind direction, wind speed, temperature, and relative humidity data at four levels (8, 30, 100, and 200 feet). Other meteorological variables measured at the tower site are insolation, barometric pressure, and precipitation.

Figure I shows the configuration of the monitoring station. The station provides a sturdy and protective covering for the monitoring equipment.

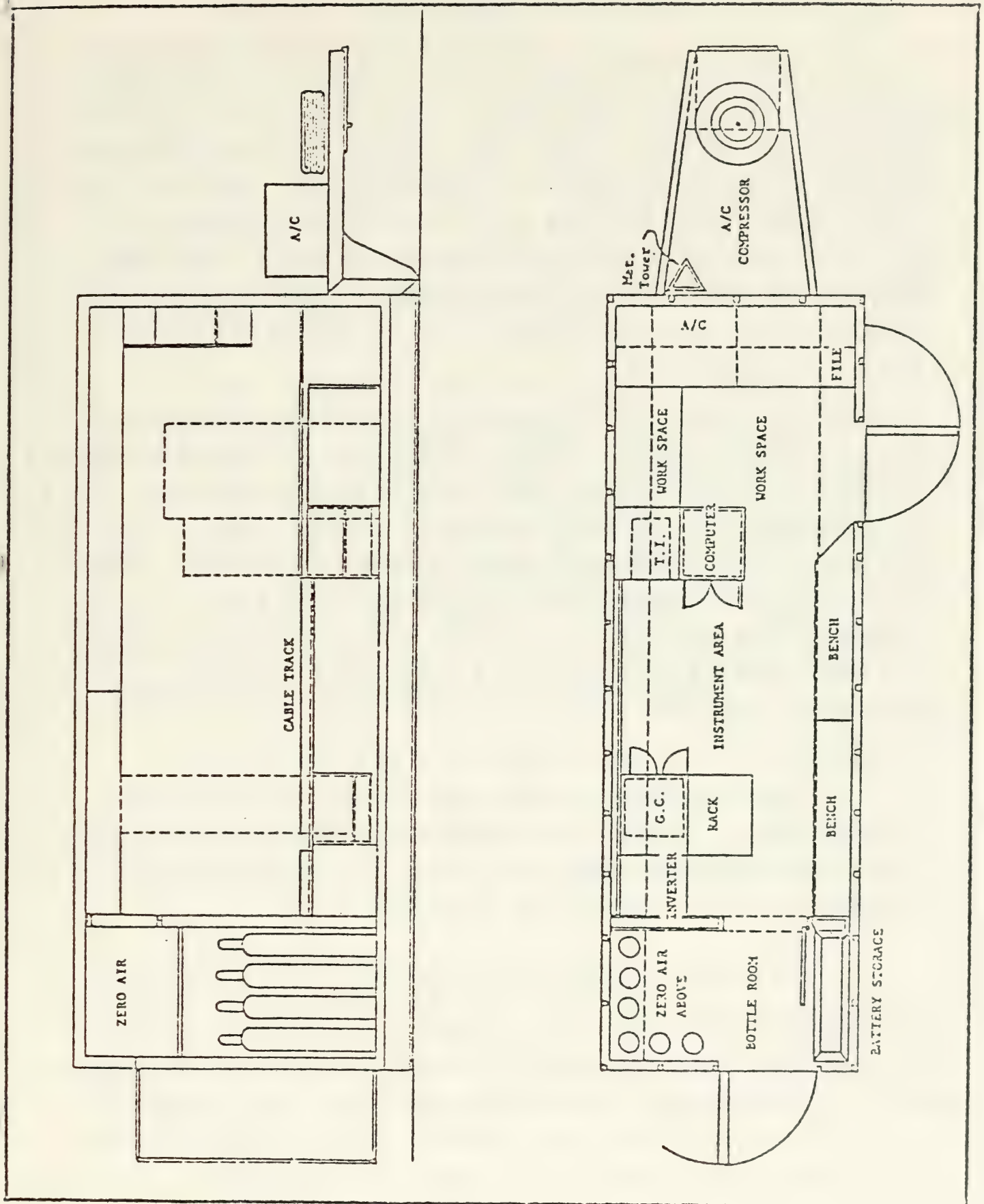


Figure 1

A. Air Quality Instrumentation

Nitrogen oxides are measured with a Meloy Model NA520 analyzer. This dual-channel analyzer is based on the chemiluminescent principle and continuously monitors both NO_x and NO . A subtraction circuit in the instrument provides a continuous NO_2 output, but is not used in Radian's system. NO_2 is calculated once a second by the computer by subtracting the NO value from the NO_x value, thus avoiding any drift which might occur in the NO_2 output of the instrument. This instrument has a minimum detectable sensitivity of 5 ppb (parts per billion) and a linearity of $\pm 1\%$.

Sulfur dioxide is measured with the Meloy SA185-2A analyzer while hydrogen sulfide is measured with the Meloy SA185-2 analyzer. The hydrogen sulfide analyzer uses a Meloy Model SO_2 -1 sulfur dioxide scrubber and the sulfur dioxide analyzer uses a Meloy Model H_2S -1 hydrogen sulfide scrubber. The Model SA185-2 is a continuous analyzer and utilizes the flame photometric principle of operation. The minimum detectable sensitivity for the Model SA185-2 is 5 ppb with a linearity of $\pm 1\%$ and the minimum detectable sensitivity for the Model SA185-2A is 2 ppb with a linearity of $\pm 1\%$.

Ozone is measured with a Meloy Model OA350 analyzer. This instrument, based on the chemiluminescent principle, provides continuous measurement of ozone. The minimum detectable sensitivity is 0.5 ppb and the linearity is $\pm 1\%$.

Total hydrocarbons, methane, and carbon monoxide are monitored with a Bendix Model 8200 gas chromatograph analyzer. This instrument, which uses a plume ionization detector, has a minimum detectable sensitivity of 5 ppb for all three components. The Model 8200 works on a five-minute cycle, i.e., one air sample is analyzed every five minutes, and the results are displayed for five minutes via a sample and hold circuit.

The air sample is drawn in through a glass cane and manifold supplied by the Ace Glass Company. The system has a 25mm diameter, through which a constant air flow is provided by an air pump rated at 60 cfm at 0" head pressure. The manifold has sampling ports to which 1/4" teflon lines to the instrument are connected. All joints in the sampling system are secured by O-ring compression fittings. The manifold is contained in a heated (100°F) chamber to prevent condensation of moisture. The teflon lines from the manifold to the instruments are insulated with 1/8" wall thickness rubber tubing.

The trailer has four heavy duty high volume particulate samplers (Hi-Vols). Fiberglass filter paper is used for the collection of particulate samples, after which each filter is brought to a controlled humidity before weighing. Each Hi-Vol has a flow recorded to permit correction for changes in air flow as the filter becomes loaded with particulates. Each Hi-Vol runs for a 24-hour period (midnight to midnight) and is turned on and off by the computer. The Hi-Vols, which were manufactured by Radian, were designed following guidelines recommended by the Environmental Protection Agency.

In addition to the normal Hi-Vol particulate samples, a duplicate Hi-Vol sample is collected every sixth day on special filter paper for trace element analysis. Once each quarter these samples are composited and analyzed for gross radioactivity and trace element content.

B. Calibration Procedures

The trailer contains a Meloy Model RAD-1 calibration unit. This instrument provides a zero air supply, SO₂ span gas from an SO₂ permeation tube, and NO span gas obtained by precisely

diluting bottled NO span gas. The computer-controlled calibration of all instruments is automatically performed once a day. Each instrument is first switched to zero; the computer monitors the output of each channel and takes a new zero reading after a stable zero signal has been reached. This zero reading is compared by the computer to the zero reading obtained 24 hours before, and if a drift in excess of 10 ppb has occurred, an excess zero drift light for the channel in question is turned on on the System Status Panel. Next, span gas is supplied to each channel and the computer decides when a stable span value has been reached. This value is recorded and compared to the previous day's value. An excess span drift light on the System Status Panel is turned on if a drift exceeding 10 ppb occurs. The instruments are then returned to the monitor mode and after two minutes the computer resumes data taking.

The bottled NO gas used at each site was obtained from Precision Gas Products. Pre-purified grade hydrogen is used in the SO₂ analyzers.

The SO₂ permeation tubes were manufactured by Metronics Association, Inc. Their output has been verified by comparison to the output of National Bureau of Standards tube 10-42. Both SA185 analyzers in each trailer are calibrated with the SO₂ from the permeation tube. This instrument responds to the number of sulfur atoms per molecule; thus, SO₂ can be used to calibrate both the H₂S and SO₂ monitors.

The Model OA350 ozone analyzer has its own calibration system which provides a zero check and a span check. The ozone calibration system is verified by comparison to a calibrated ozone generator maintained in Radian's laboratory in Rifle.

The Model 8200 total hydrocarbon, methane, and carbon monoxide analyzer is calibrated with undiluted span gas obtained from AirCo's Rare and Specialty Gas Division. This span gas contains methane and carbon monoxide in air, the methane being used to calibrate both the total hydrocarbon channel and the methane channel. The Model 8200 is zeroed with air from a Bendix Model 8834 zero air unit. In addition, the instrument is electronically re-zeroed at the start of every five-minute cycle.

The Hi-Vol particulate samplers were calibrated using a Calibration Kit from General Metal Works.

C. Data Acquisition System

The basis of the data acquisition system is a Data General NOVA 1200 minicomputer. The NOVA, which has a basic cycle time of 1.2 μ sec, is equipped with automatic program load and power fail/automatic restart features. The computer utilizes 16K 16-bit words of core memory. Analog-to-digital conversion is accomplished via an ADC built by Radian Corporation. The input/output unit for the system is Texas Instrument's KSR 733 keyboard/printer. This model teletype provides keyboard entry and hardcopy printed output. The data are also recorded on a cassette magnetic tape unit with three drives. The cassette unit is utilized for program storage and loading as well as for recording. To reduce wear on mechanical parts, the power to the teletype and cassette units is turned on only when the unit(s) is (are) to be used. Several important functions in the instruments as well as in the computer and the trailer are monitored by means of lights on a System Status Panel. These data lights are written onto cassette tape to monitor the complete status of the system every five minutes. The Data Acquisition System also monitors the presence of 100V power from the power lines. In its absence, the computer, which is powered by batteries, switches all trailer

systems to battery-provided power. If the line voltage is restored before the batteries are discharged to a specified level, the trailer system is switched back to line power.

D. Meteorological Instrumentation

200-Foot Meteorological Tower

The tower has instrumentation at four levels: 8 feet, 30 feet, 100 feet, and 200 feet. At all four levels, there are: wind speed, wind direction, and temperature and relative humidity sensors in a power-aspirated radiation shield. Temperature difference thermistors (also in power-aspirated radiation shields) and their associated circuitry take lapse rate measurements for the 30-foot to 100-foot layer and the 30-foot to 200-foot layer. In addition, this site has a Precision Spectral Pyranometer, a barometer, and a tipping bucket rain/snow gage.

The wind direction and speed apparatus used at each measurement level of the tower is the Model 1074-2 wind sensor by Meteorological Research, Inc. (MRI). This sensor has a 540° potentiometer for wind direction and a light chopper for wind speed. This sensor is rugged, with an all-weather coaxial cup and damped vane assembly. The prototype model has been in operation for years under the most demanding weather conditions, performing continuously with the utmost reliability. The wind sensors on the tower have been specially treated with a black paint which will promote warming of the exposed surfaces of the sensor and thereby reduce ice and snow accumulations on the moving parts of the apparatus. The specifications on the Model 1074-2 are as follows:

Wind Speed

- . Starting Threshold: 0.75 mph.
- . Response Distance: 18 feet (63% recovery).
- . Flow Coefficient: 7.9 feet/Revolution.
- . Accuracy: ± 0.4 mph or 1% (whichever is greatest)

Wind Direction

- . Starting Threshold: 0.75 mph.
- . Delay Distance: 4 feet (50% recovery).
- . Damping Ratio: 0.5 to 0.6.
- . Accuracy (540° system): $\pm 1\%$.
- . Range: 0° to 540°.

The relative humidity and temperature sensors are mounted within a power-aspirated radiation shield at each tower level. All aspirators and sensors are of the Model 840 Series by MRI. The aspirated shielded housing is designed to provide maximum radiation protection to the sensor. Ambient air is drawn into the shield and across the sensors at approximately 15 feet per second. This intake air is essentially sampled from a hemispherical space which is approximately 3-inch radius from the tube opening. Speed of the incoming air at the periphery of this hemisphere is approximately 1 mph.

The temperature sensor is comprised of a dual thermistor and resistor network. This circuit provides a linear resistance change with an air temperature change. The relative humidity sensor is placed alongside the temperature elements inside the shield where it is exposed to a constant flow of air. Circulation to both sides of the sensing element produces accurate monitoring with a good response time. The specifications on the sensing elements are as follows:

Temperature

- . Accuracy: $\pm 0.25^{\circ}\text{C}$.
- . Range: -50°C to $+50^{\circ}\text{C}$.

Humidity

- . Accuracy: $\pm 3.0\%$ RH.
- . Range: 0% to 100% Relative Humidity.

Measurements of temperature difference are taken for two layers, the 30-foot to 100-foot and the 30-foot to 200-foot layer. The thermistors and circuitry used for these measurements are separate from the thermistors measuring air temperature. The use of separate thermistors and circuitry to measure ΔT allows for much greater accuracy and resolution in the measurements, which is necessary for stability assessments. Two ΔT thermistors are at the 30-foot level, one is at the 100-foot level, and one is at the 200-foot level. All of these ΔT thermistors are mounted within power-aspirated radiation shields. The specifications on the ΔT instrumentation are as follows:

- . Accuracy: $\pm 0.1^{\circ}\text{C}$.
- . Range of ΔT Circuit (Lower Level-Upper Level):
 $+9\text{F}^{\circ}$ to -9F° .

All instrumentation, except at the ground level, is mounted at the end of 12-foot retractable booms. These booms are 3-inch box beams which are on rollers and can be retracted to the instrument platforms for instrument maintenance.

The meteorological tower itself is a 200-foot Rohn Model 80 Guyed Tower, designed for 40 pounds per square foot wind load with $\frac{1}{2}$ " of radial ice per EIA Standard RS-222-B, to

support four levels of meteorological equipment. The material consists of tower sections with a tapered base, three retractable booms 12-feet long, three outside work platforms, an inside ladder for climbing, two base ground kits and one anchor ground kit. The cable-type Safety Climbing Device consists of a cable and attachment mechanisms with a locking sleeve and safety belt. The tower is lighted and painted according to FAA specifications.

The signals from the tower instrumentation are fed from multiple signal cables into transmitters mounted at the base of the tower. After signals have been converted to analog signals, they are fed into a junction box, also at the tower base, where they are assimilated into one coaxial cable. The signals are then run underground within 3" PVC conduit to the A-to-D assembly, where they are processed. The transmitters are shielded and insulated from the elements. The signal cable is run underground in PVC conduit in order to minimize damage from the weather or from various rodents in the region.

The auxiliary equipment at the tower site consists of a heated tipping bucket rain/snow gage, an analog barometer, and a Precision Spectral Pyranometer. The rain/snow gage is the Model P511-E unit by Weather Measure. In the case of this gage, the durability and reliability of a tipping bucket gage are combined with heavy-duty electric heaters to make this an all-purpose precipitation sensor. This gage may be used to measure both snowfall and rainfall. An insulating cover of poly-vinyl chloride and a thermostatic control insure the proper gage temperature. The thermostatic control is adjustable from 0 to 35°C. Snow falling into the inlet funnel is melted. The resulting water (from rain or snow) drains into a precision tipping bucket mechanism which activates a mercury switch each time the bucket fills and tips. The gage is constructed of durable corrosion-resistant materials to provide many years of service. The

specifications for this gage are as follows:

- . Orifice: 8 inches.
- . Calibration: 0.01 inch.
- . Accuracy: 0.5% (Calibrated at 0.5 in/hr).
- . Sensor: Chrome-plated tipping buckets.
- . Switch: Mercury, 0.1-second closure.
- . Heat Control: Thermostat adjustment, 0 to 35°C.

The barometer is the B242 Analog Output Barometer by Weather Measure. This barometer provides an output voltage that is linearly proportional to pressure. The specifications on this instrument, which is mounted inside the monitoring trailer at the site, are as follows:

- . Range: Specially designed for the 100 millibar interval from 725 millibars to 825 millibars.
- . Resolution: Infinite.
- . Linearity: ± 0.5 millibar, over the 100 millibar interval.

The pyranometer at the site is the Eppley Precision Spectral Pyranometer. This instrument is used for the measurement of sun and sky radiation totally or in defined wavelength bands. The pyranometer is levelled and mounted atop a wooden stand $4\frac{1}{2}$ feet from the ground surface. Care has been taken to eliminate the effects from all outside influences, such as reflection or shadows, on the pyranometer. The instrument characteristics are as follows:

- . Sensitivity: 5 mv. per $\text{cal}/\text{cm}^2/\text{min}$.
- . Independence: 300 ohms.
- . Temperature dependence: Sensitivity constant to within ± 1 percent over the ambient temperature range from -20 to +40°C.

- . Linearity: Response linear up to intensities of 4 cal/cm²/min.
- . Response time: 1 second (i/e signal).

All instrumentation is factory-calibrated and is field-calibrated at various intervals. Sling psychrometers are used to calibrate the humidity sensors; known temperatures and/or resistances are used to calibrate the thermistors; and an rpm calibrating unit is used to calibrate the anemometers. The wind direction instrumentation is aligned to true north (reference direction) by means of a surveyor's transit.

III. MICROMETEOROLOGICAL AND TERRAIN FEATURES

The Piceance Creek Valley and C-b Shale Oil Tract are situated such that many microscale meteorological phenomena affect the region where the ambient air monitoring unit is located. Trailer 023 and its associated 200-foot meteorological tower are located atop a plateau to the south of the valley, high enough to be affected mostly by gradient flow conditions.

The elevation at the meteorological tower site (Trailer 023) is 6940 feet above sea level. The largest gradients in elevation in this area, of course, occur at the Piceance Creek Valley walls. However, the northern valley walls are slightly steeper than those at the southern boundary of the valley, which then slopes upward gradually toward the C-b Tract. The Piceance Creek Valley decreases in elevation from east to west in this area, so that nighttime katabatic cold-air drainage flows advect from east to west.

Site 023 is approximately 2.5 miles south of the Piceance Creek Valley. This location is relatively high compared to its surroundings, with the nearest point having an elevation greater than 7000 feet being .5 miles to the south of the tower. The tower itself is on the top of a small knoll located between Scandard and Sorghum Gulches. Because of its location and the irregularities of the surrounding terrain, meteorological patterns are varied here.

Wind instrumentation is mounted at four levels of the meteorological tower: 8 feet, 30 feet, 100 feet, and 200 feet. The top level of the tower generally remains in gradient wind flow. That is, the winds at that level are normally generated

by synoptic-scale features and are usually separated from terrain features and micrometeorological circulations. Occasionally, a weak anabatic flow influence is experienced. However, such is not the case with the three lowest measurement levels. To varying degrees, these levels are influenced by both the katabatic and anabatic circulation cells. However, when strong pressure gradient forces exist in the region and the synoptic-scale wind flow is strong, all four tower levels will reflect a gradient wind flow as the winds increase in strength and height.

The terrain atop the plateau is generally barren and fairly rugged, with a few scattered small trees. The topsoil dries rapidly and is very fine, resulting in blowing dust when dry, windy conditions exist. In the Piceance Creek Valley, the terrain is fairly grassy and flat, with steep valley walls on either side. Surface winds are normally rather light in this valley unless channeling effects occur.

During clear nights with rather light pressure gradient-induced winds, rapid radiational cooling will occur in the region because of the barren nature of the terrain and the generally dry character of the air in this portion of the country. As a result, the diurnal range of temperatures will be extremely large. Because of the katabatic flow in the valley, nighttime temperatures will generally be lower in the valley than on the plateau. During the winter, especially, temperatures in the valley may be 20F° lower than they are on the plateau during the early morning hours.

IV. OPERATING TIME ANALYSIS FOR EACH SITE

This section presents the operating statistics for each of the major subsystems contained in the monitoring station. Table I shows the specific number of hours that each of these subsystems were inoperative for the month. The column labeled "DIGITIZING SYSTEM" indicates the entire data acquisition system; therefore, downtime hours appearing in this column means total loss of data. These instances include, in addition to computer downtime, power failures, no power available, and self-automated shutdown periods such as during air conditioner malfunctions.

Calibration time is not considered to be downtime and is, therefore, not included in the downtime figures. The amount of time used in calibrating the instruments is given at the bottom of the downtime analysis table and is reported as total calibration hours for each channel for the entire month. As is evident in the calibration figures, channels can be calibrated independently of one another. No calibration time is given for particulate monitoring since Hi-Vol calibration occurs infrequently and only during the off-duty cycle for each Hi-Vol while another Hi-Vol is taking data.

TABLE I.
 POINT-OF HOURS FOR C-B SMALL OIL PROJECT

SEE 025

UTILIZING

DATE	SYSTEM	OGA	ED	SO2	WS	WD	RM	TOOL	PVR	SO2	VOLT	THC	CH4	CU	U3	PRES	RAIN	PART
8/1	0.	0.	0.	0.	24.	24.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8/2	0.	0.	0.	0.	24.	24.	24.	9.	0.	0.	0.	6.	6.	0.	0.	0.	0.	0.
8/3	0.	0.	0.	0.	24.	24.	24.	0.	0.	0.	0.	17.	17.	4.	0.	0.	0.	0.
8/4	0.	0.	0.	0.	7.	24.	24.	0.	0.	0.	0.	6.	16.	0.	0.	0.	0.	0.
8/5	0.	5.	5.	1.	1.	24.	24.	1.	1.	1.	1.	2.	10.	1.	1.	1.	1.	24.
8/6	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
8/7	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
8/8	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	9.	9.	0.	0.	0.	0.	24.
8/9	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	2.	2.	0.	0.	0.	0.	24.
8/10	0.	3.	3.	0.	1.	24.	24.	0.	0.	0.	1.	3.	3.	3.	0.	0.	0.	24.
8/11	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
8/12	0.	0.	0.	0.	0.	10.	24.	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
8/13	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	11.	11.	0.	0.	0.	0.	0.
8/14	0.	0.	0.	0.	1.	0.	24.	0.	0.	0.	0.	24.	24.	24.	0.	1.	0.	0.
8/15	0.	16.	16.	0.	0.	0.	24.	0.	0.	0.	0.	22.	22.	22.	3.	0.	0.	0.
8/16	0.	23.	23.	1.	0.	0.	24.	0.	0.	11.	0.	22.	22.	22.	0.	0.	0.	0.
8/17	2.	10.	9.	3.	0.	0.	22.	0.	0.	22.	2.	7.	7.	7.	0.	0.	0.	0.
8/18	1.	0.	0.	4.	1.	0.	23.	4.	0.	16.	1.	4.	4.	1.	0.	0.	0.	24.
8/19	2.	0.	0.	0.	0.	0.	22.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8/20	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8/21	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
8/22	0.	0.	0.	0.	10.	10.	24.	16.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8/23	5.	7.	7.	0.	19.	19.	19.	19.	0.	3.	0.	0.	0.	0.	0.	0.	0.	0.
8/24	0.	9.	9.	0.	12.	12.	24.	21.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
8/25	0.	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
8/26	0.	0.	0.	0.	0.	0.	18.	18.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
8/27	0.	0.	0.	0.	0.	0.	24.	24.	0.	4.	0.	0.	0.	0.	0.	0.	0.	0.
8/28	0.	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	1.	0.	24.
8/29	0.	0.	0.	0.	0.	0.	24.	24.	0.	2.	0.	0.	0.	0.	0.	0.	0.	24.
8/30	0.	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8/31	0.	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
CAL. TIME		56.	56.	7.	0.	0.	0.	0.	0.	5.	0.	8.	8.	8.	9.	0.	0.	0.

TABLE I.
DOUBLETIME HOURS FOR C-B SHALE OIL PROJECT

SITE 025

COLLIERING

DATE	SYSTEM	WS1	WD1	RH1	IMP1	WS2	WD2	RH2	IMP2	WS3	WD3	RH3	IMP3	WS4	WD4	RH4	IMP4	DT1	DT2
8/1	0.	24.	24.	24.	0.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/2	0.	24.	24.	7.	0.	24.	24.	24.	9.	24.	24.	24.	0.	24.	24.	24.	8.	24.	24.
8/3	0.	24.	24.	0.	0.	24.	24.	24.	0.	24.	24.	24.	0.	24.	24.	24.	0.	24.	24.
8/4	0.	7.	24.	0.	0.	7.	24.	24.	0.	7.	24.	24.	0.	7.	24.	24.	0.	24.	24.
8/5	0.	1.	24.	1.	1.	1.	24.	24.	1.	1.	24.	24.	1.	1.	24.	24.	1.	24.	24.
8/6	0.	0.	24.	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	24.	24.
8/7	0.	0.	24.	0.	1.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	24.	24.
8/8	0.	0.	24.	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	24.	24.
8/9	0.	0.	24.	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	24.	24.
8/10	0.	0.	24.	1.	1.	1.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	24.	24.
8/11	0.	0.	24.	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	24.	24.
8/12	0.	0.	10.	0.	0.	0.	10.	24.	0.	0.	24.	24.	0.	0.	10.	24.	0.	24.	24.
8/13	0.	0.	0.	0.	0.	0.	0.	24.	0.	0.	24.	24.	0.	0.	0.	24.	0.	24.	24.
8/14	0.	0.	0.	0.	0.	1.	0.	24.	0.	0.	24.	24.	0.	1.	0.	24.	1.	24.	24.
8/15	0.	0.	0.	0.	0.	0.	0.	24.	0.	0.	24.	24.	0.	0.	0.	24.	0.	24.	24.
8/16	0.	0.	0.	0.	0.	0.	0.	24.	0.	0.	24.	24.	0.	0.	0.	24.	0.	24.	24.
8/17	2.	0.	0.	0.	1.	0.	0.	22.	0.	0.	22.	22.	0.	0.	0.	22.	0.	22.	22.
8/18	1.	0.	0.	1.	2.	1.	0.	23.	4.	4.	23.	23.	5.	0.	0.	23.	7.	23.	23.
8/19	2.	0.	0.	3.	3.	0.	0.	22.	3.	0.	22.	22.	3.	0.	0.	22.	13.	22.	22.
8/20	0.	0.	0.	0.	0.	0.	0.	24.	0.	0.	24.	24.	0.	0.	0.	24.	24.	24.	24.
8/21	0.	0.	0.	0.	0.	0.	0.	24.	0.	0.	24.	24.	0.	0.	0.	24.	24.	24.	24.
8/22	0.	0.	0.	0.	16.	10.	10.	24.	16.	11.	24.	24.	16.	0.	0.	24.	24.	24.	10.
8/23	5.	0.	0.	0.	5.	19.	19.	19.	19.	19.	19.	19.	19.	0.	0.	19.	19.	19.	0.
8/24	0.	0.	0.	0.	10.	12.	12.	24.	21.	12.	12.	24.	21.	0.	14.	24.	24.	24.	0.
8/25	0.	0.	0.	0.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	10.	24.	24.	24.	12.
8/26	0.	0.	0.	0.	18.	0.	0.	18.	18.	0.	0.	18.	18.	0.	0.	18.	18.	18.	0.
8/27	0.	0.	0.	0.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	0.
8/28	0.	0.	0.	0.	24.	0.	0.	24.	24.	1.	1.	24.	24.	1.	1.	24.	24.	24.	1.
8/29	0.	0.	0.	0.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	0.
8/30	0.	0.	0.	0.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	0.
8/31	0.	0.	0.	0.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	0.
CAL TIME		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

TABLE I.
DOWNTIME HOURS FOR C-B SHALE OIL PROJECT

SEP 023

DATE	WTS1	FWO1	VWD1	BWS2	HWD2	VWD2	BWS3	HWD3	VWD3	WSD1	VSD1	HSD2	VSD2	HSD3	VSD3
8/ 1	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/ 2	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/ 3	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/ 4	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/ 5	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/ 6	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/ 7	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/ 8	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/ 9	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/10	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/11	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/12	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/13	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/14	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/15	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/16	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/17	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/18	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/19	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/20	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/21	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/22	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/23	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/24	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/25	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/26	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/27	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/28	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/29	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/30	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
8/31	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.	24.
CAL TIME	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

V. MONTHLY METEOROLOGICAL SUMMARY

A. Summary of the Meteorological Conditions over
North America during August 1977

Slightly above normal or above normal temperatures affected most sections of the country during August 1977. Exceptions were the north central section of the United States and the Rockies which experienced slightly below normal temperatures. The central and southeastern sections of the country experienced near normal temperatures. Precipitation totals were generally above normal except for the Rockies where slightly below normal precipitation totals occurred. Precipitation totals were excessively above normal along the west coast and near normal in the northeast. The polar front jet stream was located in the northern United States. Zonal flow dominated throughout most of the month.

Extratropical low pressure systems were somewhat more frequent during August than during July. The low pressure systems primarily affected the Great Plains. The dates and locations of these low pressure systems are as follows:

9th:	Great Plains
16th - 17th:	Great Lakes
26th - 27th:	Great Plains
30th - 31st:	Great Plains
31st:	Upper Midwest

On a sectional basis, the following temperature and precipitation anomalies existed during August.

<u>Section</u>	<u>Temperature</u>	<u>Precipitation</u>
Northeast	Slightly above normal	Near normal
Atlantic Seaboard	Slightly above normal	Variable; mostly above normal
North Central	Slightly below normal	Variable; mostly above normal
Central	Near normal	Variable; mostly above normal
Southeast	Near normal	Variable; mostly above normal
Southwest	Slightly above normal	Variable
Rockies	Slightly above normal	Variable; mostly slightly below normal
West and Pacific Northwest	Above normal	Variable; mostly excessively above normal

B. Summary of the Meteorological Conditions in
Northwestern and West Central Colorado During
August 1977

Grand Junction, Colorado, sixty miles to the southwest of the Tract C-b, received a total of 0.59 inch of precipitation during August, which is 0.46 inch below the monthly normal of 1.05 inches. Measurable precipitation occurred on the 15th, 17th, 26th, and the 27th. The region received 79 percent of the possible monthly sunshine. Sky cover by cloudiness averaged 4.8 out of a possible 10 during the daylight hours. The region had eight clear days, nineteen partly cloudy days, and four cloudy days during the month.

Air mass changes were infrequent during August. Only four frontal passages occurred during the month due to the weakness and northern location of the westerlies. Transport winds were approximately the same strength in August as during July. Weak continental polar cold frontal passages occurred on the 5th and the 10th. Maritime polar cold frontal passages occurred on the 26th and the 30th.

C. Summary of the Meteorological Conditions in the
Oil Shale Tract C-b Region during August 1977

Several short wave troughs moving through western Colorado accounted for the slightly above normal precipitation in the Tract C-b region during August. Precipitation occurred on the 5th, 15th, 16th, 17th, 21st, 22nd, and the 24th through the 27th. Weak continental polar cold frontal passages occurred on the 5th and the 10th. Maritime polar cold frontal passages occurred on the 26th and the 30th.

Monthly average temperatures recorded at the meteorological tower during August were 66.1°F at 8 feet, 65.8°F at 30 feet, 65.8°F at 100 feet, and 66.1°F at 200 feet. These averages are approximately 3°F lower than those recorded during July. The warmest days of the month were the 2nd, 3rd, 7th, 8th, 9th, and the 14th. The coolest days were the 26th, 27th, and the 28th. The highest temperature recorded at the meteorological tower during August was 89°F at the 8-foot level on the 2nd, 3rd, and the 7th. The coldest temperature recorded at the meteorological tower was 38°F at the 200-foot level late at night on the 26th, and early in the morning on the 27th.

Relative humidity data was obtained only at the 8-foot level of the meteorological tower during August. The average relative humidity during the month was 44.6 percent. The most humid days at the 8-foot level were the 5th, the 16th through the 19th, and the 27th. The driest days were the 3rd and the 7th through the 10th. Wind direction data was obtained at the meteorological tower from August 12th through the 31st at the 8-, 30-, and 200-foot levels. At the 100-foot level, wind direction data was obtained from the 24th through the 31st. Wind speed data was obtained at the meteorological tower from

August 4th through the 31st at all four levels. Resultant wind vectors at the meteorological tower during August were as follows: 222.9 degrees at 2.0 miles per hour at 8 feet; 222.0 degrees at 2.6 miles per hour at 30 feet; and 224.4 degrees at 3.6 miles per hour at 200 feet.

The scalar average wind speeds associated with these resultant wind vectors were 5, 7, and 8 miles per hour, respectively. The Ekman spiral and Ekman effect, i.e., a veering in direction and increase in speed as a function of increasing height above the surface, were in evidence during most of August. A reference to the August wind rose for the meteorological tower indicates that the winds at that location were primarily south-southwesterly with a high percentage of southwesterly winds in addition.

The windiest days of the month at the meteorological tower were the 4th, 5th, the 24th through the 26th, and the 30th. The days having the lightest winds were the 22nd, 27th, and the 28th. The highest five-minute average wind speed recorded at the tower during August was 33 miles per hour at the 200-foot level on the 26th.

Precipitation totals in the Tract C-b monitoring network during August were generally slightly above normal. During August 1.68 inches of precipitation were recorded at the meteorological tower. The largest daily precipitation total recorded in the network during August was 0.33 inch on August 26th. The greatest five-minute precipitation total recorded during the month was 0.08 inch (a precipitation rate of 0.96 inch/hour), recorded on the 5th. Measurable precipitation ($\geq .01$ inch) was recorded at the meteorological tower on the 5th, the 15th through the 17th, 21st, 22nd, and the 24th through the 27th.

The monthly average station pressure during August was 793.3 millibars at the meteorological tower. This reading is 0.9 millibars lower than the July average station pressure of 794.2 millibars. The highest daily average station pressures occurred on the 1st, 2nd, and the 16th through the 20th. The lowest daily average station pressures occurred on the 25th through the 27th and the 30th.

The amount of cloudiness remained approximately the same in the Tract C-b region during August, compared to the July cloud cover and insolation statistics. The region received an insolation total of 13,962.4 langleys during a 30-day averaging period, which is equivalent to a daily average insolation total of 465 langleys/day. This average is below the normal for August of 530 langleys/day in the Tract C-b region. On a diurnal basis, the greatest solar radiation rates occurred between 1100 and 1200 hours. The greatest daily radiation totals were received on the 1st, 2nd, and the 7th. The lowest daily solar radiation totals were received on the 17th, 21st, and the 24th. The greatest five-minute radiation total received during August was 8.55 langleys (a rate of 1.71 langleys/minute), which occurred on the 6th. The largest hourly insolation total received during August was 84 langleys, which occurred on the 19th between 1200 and 1300 hours.

Because of the progressively decreasing solar elevations and the increasingly shorter periods of daylight that prevailed during August, the total possible solar radiation which could be received during a day decreased monotonically throughout the month.

The unstable stability classes occurred more often during August than during July. Using the Pasquill method of stability determination, "C" stability (slightly unstable) was

the most common stability, occurring during 138 daytime hours, or 41 percent of the time. In decreasing order of frequency, "D" (neutral stability) stability occurred during 122 hours, or 36 percent of the time, and "B" (very unstable) stability occurred during 80 hours, or 23 percent of the time. "A" (extremely unstable) stability did not occur.

Data using the lapse rate method of stability determination ($\frac{dT}{dZ}$) was obtained from August 22nd through the 31st at Level II. Level I was inoperable throughout the entire month. Using the lapse rate method of stability determination ($\frac{dT}{dZ}$), the neutral ("D"), slightly stable ("E"), and extremely stable ("F") stability classes were the most prevalent during the last part of August. In general, stable and/or neutral conditions prevailed during the nighttime hours and unstable and/or neutral conditions prevailed during the day. The following table is a diurnal breakdown of the various stability classes. As one proceeds from "A" to "F", the stability class ranges from extremely unstable to extremely stable. The column labeled "number of occurrences" indicates the number of times a particular stability class occurred during the period on an hourly basis. Level II presents the temperature change versus height values ($\frac{dT}{dZ}$) that were considered between 30 feet and 200 feet.

Data for the standard deviation of the horizontal wind (σ_θ) method of stability determination was obtained at the 8-, 30-, and 200-foot levels from August 12th through the 31st. Data for the 100-foot level was obtained from August 24th through the 31st. Using the standard deviation of the horizontal wind (σ_θ) method of stability determination, "E" stability was the most common stability classification at the 30-, 100-, and 200-foot levels due to the moderately strong winds at those levels. At the 8-foot level, the "D" stability classification was the

LEVEL II ($\frac{dT}{dz}$) 30 FEET TO 200 FEET

Stability/No. of
Class Hour: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 Occurrences

A:	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3
B:	0	0	1	0	0	0	0	0	2	4	4	3	2	4	4	2	0	0	0	0	0	0	1	27
C:	0	0	0	0	0	0	0	2	2	2	1	1	1	2	0	1	1	0	0	0	0	0	0	13
D:	2	2	0	1	1	0	1	3	4	2	1	1	5	6	4	6	7	9	6	1	1	1	1	66
E:	1	2	3	4	4	5	3	4	0	0	0	0	0	0	0	0	0	3	6	6	5	4	3	53
F:	5	4	4	3	3	3	4	1	0	0	0	0	0	0	0	0	0	0	3	3	4	5	5	47

- A: extremely unstable
 B: very unstable
 C: slightly unstable
 D: neutral
 E: slightly stable
 F: extremely stable

most common stability classification. The stability distributions for the 30-, 100-, and 200-foot levels were similar. The 8-foot level of the tower exhibited higher percentages of the unstable classes because of excessive mechanical turbulence.

No vertical direction wind data was obtained from the bivanes during August. Thus, no comparison may be made of σ_{θ} values between the bivanes and the standard wind instrumentation.

VI. DATA PRESENTATION AND SUMMARY

This section includes summaries for various recorded data at the monitoring sites. The data presentations indicate the variability of pollutant concentrations and meteorological parameters with location and time. In addition, the presentations indicate the functional dependence of pollutant concentration with wind direction. All data except suspended particulates (24-hour samples) are sampled once each second, but recorded as five-minute arithmetic averages of the one-second samples. This averaging technique tends to smooth instantaneous maximum values, and is especially evident when comparing wind gusts to local weather bureau data.

Inherent to any data acquisition system is random noise both from the recording instruments and quantization in the analog-to-digital conversion. The lower threshold for all analytical instruments is twice the maximum noise level generated by the instruments. This lower threshold is 5 ppb for all instruments, except for the ozone analyzer, for which it is 0.5 ppb. Therefore, any values appearing in the data presentations that are less than 5 ppb indicate only a trace of pollutant in question and should not be construed to be absolute levels. In addition, the recorded quantity is simply random noise and averages tend toward zero. Thus, when concentrations are below the lower threshold of the analytical instruments they may appear as a zero entry in the data presentation which does not indicate absolute zero concentration.

All pollutant data (except for particulate data) is taken at the monitoring site in integer parts per billion (ppb) but is presented here in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)

assuming standard temperature and pressure of 25°C and 760 mmHg (1013.2 millibars), respectively. The scale factors required to convert $\mu\text{g}/\text{m}^3$ at standard conditions back to ppb for the various pollutants are given in the following table.

POLLUTANT	TO CONVERT $\mu\text{g}/\text{m}^3$ AT 25°C AND 760 mmHg TO ppb MULTIPLY BY
NO _x	.534
NO	.534
NO ₂	.534
SO ₂	.384
H ₂ S	.723
THC	1.536
CH ₄	1.536
CO	.877
O ₃	.512

The units of the meteorological parameters are given in the table. It should be noted here that inside temperature is monitored and recorded as a functional part of the system but is not presented in this report.

Table III displays the monthly statistics for each monitoring station for the month. To insure statistical significance, and to reduce the possibility of introducing a bias in the presentation, averages are computed only when at least 50 percent of the samples are present, except for relative humidity and temperature, in which case 75 percent of the samples are required. If less than the required samples are present for a particular parameter, that entry will be blank. The number of

samples present for a particular channel is defined as the total possible number of five-minute samples for the averaging time less the computer downtime less the channel downtime less the channel calibration time. The averages in Table III are arithmetic averages with the following exceptions:

- Wind speed and wind direction are computed using a vector averaging technique where the wind speed is treated as the vector magnitude.
- Particulate averages are computed as the geometric mean.

Table IV displays the daily averages. Again, 50 percent of the five-minute samples are required in order to compute an average except for the cases of relative humidity and temperature which require 75 percent. A blank entry indicates an insufficient number of five-minute samples present for that day. Wind speed, wind direction, and particulate averages are computed the same way as described in Table III.

Table V presents the maximum daily five-minute average retained in the data base as well as the time of occurrence. A five-minute maximum average is printed if any samples are present for that day. Therefore, the maximum five-minute average for a channel which experienced considerable downtime or calibration time during the day in question may be misrepresentative of the maximum expected for that channel on that day.

Table VI indicates the five largest averages for various averaging times. The table shows the period of time covered by the average. Maxima are chosen so that time segments

are independent. The maximum averages reported are found using a 'sliding average' technique with the exception of the 24-hour particulate average, which is computed from midnight to midnight. For averaging times less than or equal to three hours, the sliding average is stepped one five-minute sample at a time. For longer averaging times the step size is twelve samples or one hour. For averaging times less than or equal to one hour 100 percent of the five-minute samples must be present to compute an average. Averaging times greater than one hour require 90 percent. Whether or not a sliding average is computed is solely determined by the number of samples present in that averaging time and is independent of daily and monthly averaging criteria.

To demonstrate the functional dependence of recorded parameters upon wind direction, Table VII shows pollutant concentration displayed in a bi-variate distribution with wind direction. The tables display the total number of five-minute samples occurring in each concentration and wind speed class. The mean concentration for all samples occurring in each wind class are also shown. This distribution demonstrates the dependence of high pollutant concentrations upon wind direction. Appendix A shows the stability wind rose diagrams.

The wind speed classifications used in Appendix A are based on the Beaufort wind scale classification system. This is a system of estimating and reporting wind speeds, invented in the early nineteenth century by Admiral Beaufort of the British Navy. It was originally based on the effects of various wind speeds on the amount of canvas that a full-rigged frigate of the period could carry, but has since been modified and modernized. In its present form for international meteorological use it equates: (a) Beaufort force (or Beaufort number); (b) wind speed;

(c) descriptive terms; and (d) visible effects upon land objects or the sea surface. One land adaptation is the NRM wind scale.

The six basic wind speed classifications used in the report are: 1-3 knots, 4-6 knots, 7-10 knots, 11-16 knots, 17-21 knots, and winds of greater than 21 knots. The following table is a complete description of the Beaufort Wind Scale, taken from Physical Climatology, by Helmut Landsberg, 1969.

BEAUFORT WIND SCALE FOR OBSERVATIONS AT LAND STATIONS

Force	Explanatory Title	Specification for Use	Corresponding Limits of Wind Speed at 10 meters ab.grd.				
			Mi/hr.	Knots	Km/hr.	M/sec.	Ft/sec.
0	Calm.....	Smoke rises vertically.....	<1	<1	<1	0.3	1
1	Light air.....	Direction of wind shown by smoke drift, but not by wind vanes.....	1-3	1-3	1-5	0.3-1.5	1-5
2	Light breeze.....	Wind felt on face:leaves rustle:ordinary vane moved by wind.....	4-7	4-6	6-11	1.6-3.3	6-11
3	Gentle breeze....	Leaves and small twigs in constant motion;wind extends light flat.....	8-12	7-10	12-19	3.4-5.4	12-18
4	Moderate breeze..	Raises dust and loose paper:small branches are moved.....	13-18	11-16	20-28	5.5-7.9	19-26
5	Fresh breeze.....	Small trees in leaf begin to sway:wavelets formed on inland waters.....	19-24	17-21	29-38	8.0-10.7	27-35
6	Strong breeze....	Large branches in motion:whistling heard in telegraph wires:umbrellas used with difficulty.....	25-31	22-27	39-49	10.8-13.8	36-45
7	High wind.....	Whole trees in motion:inconvenience felt when walking against wind.....	32-38	28-33	50-61	13.9-17.1	46-56
8	Fresh gale.....	Breaks twigs off trees:generally impedes progress.....	39-46	34-40	62-74	17.2-20.7	57-68
9	Strong gale.....	Slight structural damage occurs (chimney pots and slates removed).....	47-54	41-47	75-88	20.8-24.4	69-80
10	Whole gale.....	Seldom experienced inland:trees uprooted:considerable structural damage occurs...	55-63	48-55	89-102	24.5-28.4	81-93
11	Storm.....	Very rarely experiences:accompanied by widespread damage.....	64-72	56-63	103-117	28.5-32.6	94-106
12	Hurricane.....	.....	73-82	64-71	118-133	32.7-36.9	107-121
13	.....	.....	83-92	72-80	134-149	37.0-41.4	122-136
14	.....	.....	93-102	81-89	150-166	41.5-46.1	137-151
15	.....	.....	104-114	90-99	167-183	46.2-50.9	152-166
16	.....	.....	115-125	100-108	184-201	51.0-56.0	167-183
17	.....	.....	126-136	109-118	202-220	56.1-61.2	184-201

Source: Table 36 (p.119) in R.J. List (1951):Smithsonian Meteorological Tables:Smithsonian Miscell.Coll.Vol. 114.

Table VIII demonstrates the diurnal variation of various recorded parameters. Hourly averages are determined by arithmetically averaging five-minute samples, except for wind direction averages which are computed vectorially assuming unit vector magnitudes. Totals in the diurnal wind direction tables are vector averages of the columns and rows. For all parameters, a blank entry in the diurnal variation table indicates that less than half (i.e., less than 6) of the five-minute samples for that hour are present.

All times given in the data presentation are Mountain Standard Time.

To facilitate comparison of recorded concentrations to ambient air quality standards, the following regulations are presented.

TABLE II
FEDERAL AND COLORADO STANDARDS

	<u>Primary</u>	<u>Secondary</u>	<u>Non-Designated Area</u>	<u>1973</u>	<u>Designated Area</u>	
					<u>1976</u>	<u>1980</u>
<u>Particulate</u>						
Annual C. M.	75 $\mu\text{g}/\text{m}^3$	60 $\mu\text{g}/\text{m}^3$	45 $\mu\text{g}/\text{m}^3$	70 $\mu\text{g}/\text{m}^3$	55 $\mu\text{g}/\text{m}^3$	45 $\mu\text{g}/\text{m}^3$
24 Hr. Max.*	260	150	150	200	180	150
<u>Sulfur Oxides</u>						
Annual	80(.03ppm)		--	60(.02ppm)	25(.009ppm)	10(.004ppm)
24 Hr. Max.*	365(.14ppm)		15(.005ppm)	300(.1ppm)	150(.05ppm)	55(.02ppm)
3 Hr. Max.*	--	1300(.5ppm)	--	--	--	--
1 Hr. Max.**	--	--	--	800(.28ppm)	300(.1ppm)	--
<u>Oxidant</u>						
1 Hr. Max.*	160(.08ppm)	160				
8 Hr. Max.*	--	--				
Annual	--	--				
<u>Hydrocarbons</u>						
3 Hr. Max.*	160(.24ppm)	160				
6-9 a.m.						
<u>Carbon Monoxide</u>						
Max. 8 Hrs.*	10000(9ppm)	10000				
Max. 1 Hr.*	40000(35ppm)	40000				
<u>Nitrogen Dioxide</u>						
Annual	100(.05ppm)	100				

Units are micrograms per cubic meter and ppm in parenthesis.

*Not to be exceeded more than once per year.

**Not to be exceeded more than once per month.

TABLE III
AVERAGES FOR AUGUST 1 THRU 31

TABLE III. AVERAGES FOR AUG 1 THRU 31

(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITROGEN OXIDES(NOX)		NITRIC OXIDE(NO)		NITROGEN DIOXIDE(NO2)	
SITE	023	023		023	
	1.2	1.1		.1	

SULFUR DIOXIDE(SO2)		PYRANOMETER		HYDROGEN SULFIDE(H2S)	
SITE	023	023		023	
	.0	13962.4		1.2	

TOTAL HYDROCARBONS		METHANE		NON-METHANE HYDROCARBONS	
SITE	023	023		023	
	1093.5	822.0		272.5	

CARBON MONOXIDE		OZONE		BAROMETRIC PRESSURE	
SITE	023	023		023	
	239.3	95.8		793.3	

TOTAL PRECIPITATION		PARTICULATE			
SITE	023	023			
	1.6H	8.5			

TABLE III. AVERAGES FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

WIND SPEED			
SITE 023	(8-FT) 2.0	(30-FT) 2.6	(100-FT) 3.6

WIND DIRECTION			
SITE 023	(8-FT) 220.0	(30-FT) 222.0	(100-FT) 224.4

RELATIVE HUMIDITY			
SITE 023	(8-FT) 44.6	(30-FT) 44.6	(100-FT) 44.6

TEMPERATURE			
SITE 023	(8-FT) 66.1	(30-FT) 65.8	(100-FT) 65.8

SITE 023	(8-FT) 66.1	(30-FT) 65.8	(100-FT) 65.8

SITE 023	(8-FT) 66.1	(30-FT) 65.8	(100-FT) 65.8

TABLE IV
DAILY AVERAGES FOR AUGUST 1 THRU 31

TABLE IV. DAILY AVERAGES FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

DATE	SITE	NITROGEN OXIDES(NOX)		NITRIC OXIDE(NO)		NITROGEN DIOXIDE(NO2)	
		023	023	023	023	023	023
8/1	3			3		.0	
8/2	4			.4		.0	
8/3	3			3		.0	
8/4	7			.7		.0	
8/5	2.8			2.6		.1	
8/6	5.7			3.6		.0	
8/7	3.7			3.7		.0	
8/8	3.7			3.7		.0	
8/9	2.6			1.8		.8	
8/10	4.1			3.5		.6	
8/11	3.4			3.4		.0	
8/12	1.2			1.2		.0	
8/13	.0			.0		.0	
8/14	.0			.0		.0	
8/15							
8/16							
8/17							
8/18							
8/19	1.8			.4		1.5	
8/20	.2			.2		.0	
8/21	.1			.1		.0	
8/22	.0			.0		.0	
8/23							
8/24							
8/25	.2			.0		.2	
8/26	.0			.0		.0	
8/27	.0			.0		.0	
8/28	.0			.0		.0	
8/29	.0			.0		.0	
8/30	.8			.8		.0	
8/31	1.6			1.5		.1	

(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

DATE	SITE	023	SULFUR DIOXIDE(SO2)	023	PYRANOMETER	023	HYDROGEN SULFIDE(H2S)	023
8/ 1		.0		673.5		.0		
8/ 2		.0		648.1		.0		
8/ 3		.0		438.0		.0		
8/ 4		.0		399.5		.0		
8/ 5		.0		450.6		.0		
8/ 6		.0		503.0		.0		
8/ 7		.0		650.2		.0		
8/ 8		.0		476.8		.0		
8/ 9		.0		596.2		.0		
8/10		.0		511.4		.0		
8/11		.0		405.8		.0		
8/12		.0		463.5		.0		
8/13		.0		372.0		.0		
8/14		.0		379.4		.0		
8/15		.1		352.5		.0		
8/16		.0		450.5		.0		
8/17		.2		172.4				
8/18		.0		394.1				
8/19		.2		453.1		1.8		
8/20		.2		457.6		1.4		
8/21		.0		328.0		.0		
8/22		.0		525.0		1.3		
8/23		.0		229.9		7.7		
8/24		.2		282.8		5.9		
8/25		.0		548.0		8.6		
8/26		.0		198.6		3.8		
8/27		.0		420.5		1.9		
8/28		.0		537.0		4.5		
8/29		.0		578.2		.1		
8/30		.0		562.3		.0		
8/31		.0		503.7		.0		

TABLE IV. DAILY AVERAGES FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TOTAL HYDROCARBONS			METHANE			NON-METHANE HYDROCARBONS		
DATE	SITE	023	023	023	023			
8/1		1122.0	864.9		257.1			
8/2		1084.9	862.1		222.8			
8/3								
8/4		1070.5						
8/5		1049.2	844.2		195.7			
8/6		1149.7	860.1		289.7			
8/7		1179.9	855.4		324.5			
8/8		1098.3	855.6		242.6			
8/9		1095.9	853.7		242.2			
8/10		1084.3	833.8		250.5			
8/11		1118.0	860.4		257.7			
8/12		1024.6	814.1		210.5			
8/13		1096.8	823.7		273.1			
8/14								
8/15								
8/16								
8/17		1132.0	826.0		306.0			
8/18		1064.3	814.7		250.0			
8/19		1091.8	801.5		290.3			
8/20		1135.5	802.8		332.7			
8/21		1177.8	801.8		376.0			
8/22		1102.7	802.5		300.2			
8/23		1073.2	787.1		286.1			
8/24		1049.6	781.5		268.1			
8/25		1054.5	782.5		272.0			
8/26		1067.9	792.4		275.5			
8/27		1063.8	793.9		269.9			
8/28		1102.4	803.0		299.3			
8/29		1070.9	812.6		258.3			
8/30		1048.0	800.5		247.5			
8/31		1088.0	813.2		274.8			

W2 HADDOCK
CORPORATION

TABLE IV. DAILY AVERAGES FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

		CARBON MONOXIDE		OZONE		BAROMETRIC PRESSURE	
DATE	SITE	023		023		023	
8/1	1	195.3		97.4		797.4	
8/2	2	240.9		88.3		795.9	
8/3	3	505.9		87.4		793.0	
8/4	4	393.3		102.7		793.1	
8/5	5	279.6		87.8		793.2	
8/6	6	363.8		88.5		792.9	
8/7	7	273.4		103.8		792.7	
8/8	8	236.5		99.0		792.4	
8/9	9	271.8		102.8		793.3	
8/10	10	245.2		96.9		793.2	
8/11		258.7		90.3		794.9	
8/12		175.0		100.1		794.0	
8/13		170.6		104.6		792.2	
8/14				102.9		791.6	
8/15				94.1		794.1	
8/16				88.8		795.9	
8/17		212.3		87.2		797.1	
8/18		205.0		59.2		795.7	
8/19		187.7		55.9		795.4	
8/20		182.7		62.9		795.1	
8/21		207.0		77.5		793.9	
8/22		160.7		75.9		792.8	
8/23		188.0		105.4		792.4	
8/24		219.6		145.9		792.0	
8/25		218.4		133.0		789.8	
8/26		181.2		125.0		786.1	
8/27		178.5		121.7		790.1	
8/28		217.4		119.9		794.6	
8/29		249.5		103.3		794.5	
8/30		233.3		81.7		789.9	
8/31		250.1		82.4		791.0	

TABLE IV. DAILY AVERAGES FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

DATE	SITE	023	TOTAL PRECIPITATION	PARTICULATE
8/ 1				3.0
8/ 2				31.0
8/ 3				4.0
8/ 4				16.0
8/ 5		.27		
8/ 6				
8/ 7				
8/ 8				
8/ 9				
8/10				
8/11				74.0
8/12				26.0
8/13				24.0
8/14				7.0
8/15		.13		5.0
8/16		.01		4.0
8/17		.14		4.0
8/18				
8/19				
8/20				13.0
8/21		.07		6.0
8/22		.02		16.0
8/23				7.0
8/24		.16		3.0
8/25		.23		
8/26		.33		7.0
8/27		.32		1.0
8/28				
8/29				
8/30				9.0
8/31				16.0

TABLE IV. DAILY AVERAGES FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS--MICROGRAMS PER CUBIC METER; WIND SPEED--MILES PER HOUR;
TEMPERATURE--DEGREES FAHRENHEIT; WIND DIRECTION--DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER--TOTAL LANGLEYS; PRESSURE--MILLIBARS; PRECIPITATION--INCHES)

WIND SPEED

DATE	SITE 023			
	(8-FT)	(30-FT)	(100-FT)	(200-FT)
8/ 1				
8/ 2				
8/ 3				
8/ 4				
8/ 5				
8/ 6				
8/ 7				
8/ 8				
8/ 9				
8/10				
8/11	3.5	4.8		6.5
8/12	1.5	2.1		2.4
8/13	.9	1.4		1.5
8/14	2.6	3.8		5.6
8/15	2.3	3.4		5.0
8/16	1.9	2.6		3.7
8/17	3.2	3.6		6.3
8/18	1.4	1.6		3.2
8/19	1.1	1.2		2.2
8/20				
8/21	.8	1.2		1.7
8/22	2.1	1.2		2.8
8/23	3.1			5.7
8/24	5.7			
8/25	5.7			
8/26	2.6	7.6	9.3	15.9
8/27	1.3	3.5	4.4	5.0
8/28	2.0	2.0	2.4	2.4
8/29	3.4	2.5	2.7	2.9
8/30	6.6	4.2	5.3	6.0
		8.3	10.2	11.5
8/31	4.1	5.1	6.1	6.5

TABLE IV. DAILY AVERAGES FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

WIND DIRECTION

DATE	SIIE 023 (8-FT)	(30-FT)	(100-FT)	(200-FT)
8/ 1				
8/ 2				
8/ 3				
8/ 4				
8/ 5				
8/ 6				
8/ 7				
8/ 8				
8/ 9				
8/10				

8/11				262.1
8/12	273.0	264.6		340.5
8/13	331.8	326.1		267.3
8/14	266.5	262.4		212.5
8/15	216.1	209.3		184.6
8/16	177.8	176.1		179.7
8/17	189.9	183.6		250.0
8/18	250.5	244.4		353.4
8/19	351.8	4.3		329.3
8/20	309.4	319.9		

8/21	173.8	169.6		170.4
8/22	306.7	355.7		295.8
8/23	193.3			199.9
8/24	190.9			
8/25	199.6		194.9	210.4
8/26	230.2	204.3	218.0	224.4
8/27	163.8	230.7	143.1	160.9
8/28	309.4	159.0	305.7	310.3
8/29	216.4	310.5	203.7	215.5
8/30	214.3	214.9	205.8	217.4
		215.6		

8/31	234.2	234.7	223.7	234.0

TABLE IV. DAILY AVERAGES FOR AUG 1 THRU 31

(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TEMPERATURE

DATE	STIE 023 (8-FT)	(30-FT)	(100-FT)	(200-FT)
8/ 1	68.2			
8/ 2	71.1			
8/ 3	74.2			
8/ 4	68.6		74.7	74.8
8/ 5	61.9	75.0	68.4	68.2
8/ 6	66.1	68.9	61.8	61.5
8/ 7	73.2	62.0	66.5	66.2
8/ 8	73.3	66.7	73.5	74.0
8/ 9	69.4	73.6	72.8	73.0
8/10	70.0	73.5	70.7	70.7
		70.7	69.9	69.8
8/11	64.9	70.3		
8/12	68.5	66.1	66.2	66.0
8/13	68.2	69.4	69.4	69.3
8/14	70.1	69.3	69.5	69.4
8/15	64.9	70.5	70.1	70.3
8/16	65.3	65.0	65.0	64.6
8/17	63.8	65.3	65.2	64.6
8/18	65.3	63.3	63.2	63.7
8/19	63.4	61.4		63.6
8/20	67.1	62.9	62.2	
		66.2	65.2	
8/21	64.4	63.1	62.6	
8/22				
8/23				
8/24				
8/25				
8/26				
8/27				
8/28				
8/29				
8/30				
8/31				

TABLE IV. DAILY AVERAGES FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

RELATIVE HUMIDITY

SITE 023				
DATE	(8-FT)	(30-FT)	(100-FT)	(200-FT)
8/ 1				
8/ 2				
8/ 3	21.7			
8/ 4	35.1			
8/ 5	66.0			
8/ 6	51.1			
8/ 7	26.8			
8/ 8	27.4			
8/ 9	21.2			
8/10	20.9			
8/11	33.0			
8/12	30.1			
8/13	30.3			
8/14	31.9			
8/15	56.1			
8/16	64.6			
8/17	68.6			
8/18	71.0			
8/19	67.2			
8/20	52.1			
8/21	51.7			
8/22	45.5			
8/23	43.1			
8/24	56.2			
8/25	59.3			
8/26				
8/27	76.9			
8/28	55.7			
8/29	42.8			
8/30	30.8			
8/31	35.9			

TABLE V
MAXIMUM FIVE-MINUTE AVERAGES AND TIME
OF OCCURRENCE FOR AUGUST 1 THRU 31

REPORT

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
 (UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
 TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
 PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITROGEN OXIDES(NOX)

DATE	SITE	023
8/1		1.9(7:55)
8/2		3.7(4:25)
8/3		1.9(0:10)
8/4		3.7(2:15)
8/5		15.0(8:30)
8/6		3.7(0:00)
8/7		5.6(16:35)
8/8		3.7(0:00)
8/9		78.6(8:50)
8/10		9.4(5:35)
8/11		3.7(0:00)
8/12		3.7(0:00)
8/13		.0(0:00)
8/14		.0(0:00)
8/15		.0(0:00)
8/16		
8/17		
8/18		3.7(19:55)
8/19		15.0(6:20)
8/20		5.6(15:20)
8/21		5.6(14:15)
8/22		.0(0:00)
8/23		16.9(15:50)
8/24		.0(14:55)
8/25		39.3(22:35)
8/26		.0(0:00)
8/27		.0(0:05)
8/28		.0(0:00)
8/29		1.9(10:10)
8/30		11.2(11:25)
8/31		16.9(11:20)

RECEIVED
CORPORATION

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITRIC OXIDE(NO)

DATE	SITE	023
8/1		1.9(7:55)
8/2		3.7(4:25)
8/3		1.9(0:10)
8/4		3.7(2:15)
8/5		15.0(8:30)
8/6		3.7(0:00)
8/7		3.7(0:00)
8/8		3.7(0:00)
8/9		15.0(13:35)
8/10		9.4(5:35)
8/11		3.7(0:00)
8/12		3.7(0:00)
8/13		.0(0:00)
8/14		.0(0:00)
8/15		.0(0:00)
8/16		
8/17		
8/18		3.7(19:55)
8/19		5.6(16:00)
8/20		5.6(15:20)
8/21		5.6(14:15)
8/22		.0(0:00)
8/23		16.9(15:50)
8/24		.0(14:55)
8/25		.0(0:05)
8/26		.0(0:00)
8/27		.0(0:05)
8/28		.0(0:00)
8/29		1.9(10:10)
8/30		11.2(11:25)
8/31		16.9(11:20)

UNCLASSIFIED
CONFIDENTIAL

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITROGEN DIOXIDE (NO2)

DATE	SITE	023
8/1		.00 0:00)
8/2		.00 0:00)
8/3		.00 0:00)
8/4		.00 0:00)
8/5		15.0(10:05)
8/6		1.9(5:20)
8/7		1.9(16:35)
8/8		1.9(23:50)
8/9		75.0(8:50)
8/10		3.7(8:05)
8/11		.00 0:00)
8/12		.00 0:00)
8/13		.00 0:00)
8/14		.00 0:00)
8/15		.00 0:00)
8/16		
8/17		
8/18		.00(19:40)
8/19		15.0(6:20)
8/20		.00 0:00)
8/21		.00 0:00)
8/22		.00 0:00)
8/23		.00 0:00)
8/24		.00(14:55)
8/25		39.3(22:35)
8/26		.00 0:00)
8/27		.00 0:05)
8/28		.00 0:00)
8/29		1.9(13:05)
8/30		1.9(13:20)
8/31		11.2(4:05)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

SITE 023

8/ 1	.0(0:00)
8/ 2	.0(0:00)
8/ 3	.0(0:00)
8/ 4	.0(0:00)
8/ 5	.0(0:00)
8/ 6	.0(0:00)
8/ 7	.0(0:00)
8/ 8	.0(0:00)
8/ 9	.0(0:00)
8/10	.0(0:00)

8/11	.0(0:00)
8/12	.0(0:00)
8/13	.0(0:00)
8/14	.0(0:00)
8/15	18.2(7:25)
8/16	.0(0:00)
8/17	2.6(17:55)
8/18	7.8(19:30)
8/19	2.6(16:00)
8/20	2.6(0:55)

8/21	2.6(17:45)
8/22	5.2(13:05)
8/23	.0(0:00)
8/24	5.2(12:45)
8/25	.0(0:05)
8/26	.0(0:00)
8/27	.0(0:05)
8/28	.0(0:00)
8/29	.0(0:00)
8/30	.0(0:00)

15/8 00:00:00

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

HYDROGEN SULFIDE (H2S)

DATE	SITE	023
8/ 1		.0(0:00)
8/ 2		.0(0:00)
8/ 3		.0(0:00)
8/ 4		.0(0:00)
8/ 5		.0(0:00)
8/ 6		.0(0:00)
8/ 7		.0(0:00)
8/ 8		.0(0:00)
8/ 9		.0(0:00)
8/10		.0(0:00)
8/11		2.6(14:25)
8/12		2.6(4:05)
8/13		.0(0:00)
8/14		.0(0:00)
8/15		13.0(7:25)
8/16		.0(0:00)
8/17		
8/18		10.4(19:30)
8/19		13.0(1:25)
8/20		10.4(7:15)
8/21		.0(0:00)
8/22		10.4(22:25)
8/23		20.8(17:00)
8/24		13.0(4:40)
8/25		23.4(11:50)
8/26		7.8(0:05)
8/27		5.2(0:05)
8/28		10.4(4:40)
8/29		2.6(4:10)
8/30		.0(0:00)
8/31		.0(0:00)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS--MICROGRAMS PER CUBIC METER; WIND SPEED--MILES PER HOUR;
TEMPERATURE--DEGREES FAHRENHEIT; WIND DIRECTION--DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER--TOTAL LANGLEYS; PRESSURE--MILLIBARS; PRECIPITATION--INCHES)

3115 . 023

8/ 1	1290.1(18:10)
8/ 2	1196.3(17:20)
8/ 3	1477.6(22:50)
8/ 4	1340.9(0:25)
8/ 5	1219.8(13:30)
8/ 6	1380.6(16:35)
8/ 7	1297.9(9:05)
8/ 8	1215.2(8:00)
8/ 9	1237.3(23:00)
8/10	1199.6(21:30)

8/11	1234.1(8:40)
8/12	1294.6(9:50)
8/13	1411.2(11:45)
8/14	
8/15	
8/16	
8/17	1984.9(22:00)
8/18	1516.1(16:15)
8/19	1254.9(20:00)
8/20	1271.2(9:55)

8/21	1240.6(9:30)
8/22	1309.0(8:15)
8/23	1256.9(15:30)
8/24	1145.5(1:40)
8/25	1122.7(8:35)
8/26	1148.8(17:20)
8/27	1164.4(18:55)
8/28	1208.7(10:15)
8/29	1122.7(16:10)
8/30	1120.1(8:10)

8/31	1175.5(8:20)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

METHANE

DATE SITE 023

8/ 1	913.0(9:05)
8/ 2	1118.2(15:20)
8/ 3	1333.1(21:40)
8/ 4	1150.1(10:30)
8/ 5	1054.3(19:55)
8/ 6	1260.1(11:30)
8/ 7	1055.6(18:30)
8/ 8	879.8(23:55)
8/ 9	1234.1(23:00)
8/10	1038.7(12:30)
8/11	914.3(7:45)
8/12	863.5(4:00)
8/13	895.4(11:40)
8/14	
8/15	
8/16	
8/17	849.2(14:10)
8/18	1135.7(19:20)
8/19	906.5(20:05)
8/20	825.8(9:45)
8/21	1135.7(17:20)
8/22	922.8(5:50)
8/23	820.5(13:50)
8/24	814.7(12:50)
8/25	809.5(15:35)
8/26	857.7(17:20)
8/27	854.4(19:00)
8/28	855.7(19:25)
8/29	849.2(11:05)
8/30	823.8(10:15)
8/31	847.9(4:45)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NON-METHANE HYDROCARBONS

DATE	SITE	023
8/1		432.4(18:10)
8/2		349.7(23:45)
8/3		722.2(22:50)
8/4		508.0(9:25)
8/5		524.9(19:15)
8/6		431.1(16:35)
8/7		435.7(9:05)
8/8		357.5(8:00)
8/9		340.6(7:25)
8/10		373.8(22:05)
8/11		345.2(8:40)
8/12		521.6(9:50)
8/13		515.8(11:45)
8/14		
8/15		
8/16		
8/17		1144.9(22:00)
8/18		724.2(16:15)
8/19		390.1(6:30)
8/20		463.0(9:55)
8/21		670.8(17:45)
8/22		505.4(8:15)
8/23		501.4(15:30)
8/24		401.2(1:40)
8/25		345.2(8:35)
8/26		326.3(0:15)
8/27		354.9(12:45)
8/28		399.2(12:40)
8/29		319.8(18:20)
8/30		324.3(8:50)
8/31		356.2(8:20)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS--MICROGRAMS PER CUBIC METER; WIND SPEED--MILES PER HOUR;
TEMPERATURE--DEGREES FAHRENHEIT; WIND DIRECTION--DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER--TOTAL LANGLEYS; PRESSURE--MILLIBARS; PRECIPITATION--INCHES)

CARBON MONOXIDE

DATE	SITE	023
8/ 1		283.8(13:40)
8/ 2		528.8(18:45)
8/ 3		1041.6(21:20)
8/ 4		1661.6(14:10)
8/ 5		1165.9(19:55)
8/ 6		851.3(14:20)
8/ 7		364.7(17:30)
8/ 8		283.8(10:50)
8/ 9		1055.3(8:10)
8/10		710.0(11:15)
8/11		465.0(10:20)
8/12		565.3(12:25)
8/13		222.2(11:45)
8/14		
8/15		
8/16		
8/17		275.8(0:00)
8/18		1985.3(19:30)
8/19		353.3(12:30)
8/20		237.0(10:10)
8/21		1650.2(22:15)
8/22		723.7(8:55)
8/23		498.0(14:55)
8/24		406.9(7:30)
8/25		439.9(11:20)
8/26		403.4(6:25)
8/27		272.4(3:15)
8/28		679.2(14:10)
8/29		359.0(10:45)
8/30		300.9(10:55)
8/31		341.9(6:35)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

BAROMETRIC PRESSURE

DATE	SITE	023
8/1		799.0(7:25)
8/2		798.0(7:15)
8/3		794.0(0:00)
8/4		794.0(6:20)
8/5		794.0(0:00)
8/6		795.0(7:25)
8/7		797.0(9:40)
8/8		794.0(6:15)
8/9		795.0(8:00)
8/10		795.0(7:05)
8/11		797.0(8:20)
8/12		796.0(5:45)
8/13		793.0(0:00)
8/14		793.0(7:10)
8/15		796.0(20:15)
8/16		797.0(8:20)
8/17		798.0(8:05)
8/18		797.0(0:00)
8/19		797.0(8:20)
8/20		796.0(0:00)
8/21		796.0(10:00)
8/22		795.0(2:25)
8/23		794.0(7:45)
8/24		797.0(13:10)
8/25		792.0(2:40)
8/26		788.0(20:30)
8/27		792.0(21:05)
8/28		796.0(9:20)
8/29		796.0(0:00)
8/30		793.0(0:00)
8/31		793.0(7:30)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

OZONE

SITE 023

DATE

8/1	119.2(12:55)
8/2	99.6(0:15)
8/3	115.3(20:25)
8/4	121.1(12:15)
8/5	128.9(16:20)
8/6	132.9(12:55)
8/7	136.8(10:00)
8/8	123.1(18:30)
8/9	123.1(10:40)
8/10	117.2(10:45)
8/11	121.1(13:35)
8/12	115.3(12:00)
8/13	119.2(17:35)
8/14	115.3(16:25)
8/15	119.2(16:20)
8/16	121.1(12:00)
8/17	115.3(10:30)
8/18	84.0(18:45)
8/19	76.2(9:40)
8/20	93.8(18:20)
8/21	95.7(13:15)
8/22	99.6(11:40)
8/23	160.2(22:25)
8/24	171.9(12:50)
8/25	158.2(16:55)
8/26	138.7(13:05)
8/27	142.6(12:25)
8/28	148.5(12:45)
8/29	130.9(4:15)
8/30	111.4(9:55)
8/31	128.9(13:30)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TOTAL PRECIPITATION

DATE	SITE	023
8/1		
8/2		
8/3		
8/4		
8/5		.08(12:15)
8/6		
8/7		
8/8		
8/9		
8/10		
8/11		
8/12		
8/13		
8/14		
8/15		.02(20:15)
8/16		.01(2:55)
8/17		.03(10:40)
8/18		
8/19		
8/20		
8/21		.07(23:50)
8/22		.01(21:05)
8/23		
8/24		.04(15:00)
8/25		.07(2:45)
8/26		.03(22:50)
8/27		.03(1:25)
8/28		
8/29		
8/30		
8/31		

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL RADIATIONS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

DATE	SITE 423 (0-FT)	WIND SPEED (30-FT)		WIND DIRECTION (120-FT)		WIND DIRECTION (200-FT)	
		(30-FT)	(30-FT)	(120-FT)	(120-FT)	(200-FT)	(200-FT)
8/ 1							
8/ 2							
8/ 3							
8/ 4							
8/ 5							
8/ 6							
8/ 7							
8/ 8							
8/ 9							
8/10							
8/11							
8/12	12.4	209.0(13:35)	16.0	293.0(13:35)		19.0	202.0(20:05)
8/13	15.0	230.0(14:20)	21.0	228.0(14:20)		25.0	236.0(14:20)
8/14	14.0	170.0(19:20)	20.0	170.0(19:20)		27.0	174.0(19:20)
8/15	17.0	350.0(13:50)	23.0	338.0(13:55)		27.0	346.0(13:50)
8/16	11.0	216.0(14:40)	13.0	213.0(14:40)		16.0	181.0(20:05)
8/17	14.0	202.0(11:15)	16.0	198.0(11:15)		20.0	202.0(11:15)
8/18	12.0	226.0(10:15)	16.0	224.0(10:15)		22.0	252.0(10:25)
8/19	11.0	341.0(12:30)	15.0	11.0(14:20)		21.0	8.0(14:20)
8/20	12.0	5.0(16:50)	15.0	7.0(16:50)		22.0	360.0(16:50)
8/21	13.0	260.0(17:45)	15.0	272.0(17:45)		24.0	262.0(17:45)
8/22	13.0	353.0(21:00)	10.0	353.0(13:15)		25.0	338.0(21:00)
8/23	12.0	174.0(13:15)				18.0	209.0(20:45)
8/24	19.0	271.0(14:55)	23.0	252.0(15:00)	28.0	19.0	188.0(9:55)
8/25	15.0	220.0(16:20)	18.0	235.0(14:25)	22.0	26.0	197.0(23:50)
8/26	20.0	214.0(14:35)	26.0	222.0(14:05)	31.0	33.0	224.0(14:05)
8/27	10.0	214.0(12:45)	14.0	219.0(12:45)	17.0	18.0	200.0(12:50)
8/28	11.0	307.0(13:20)	13.0	317.0(14:55)	16.0	16.0	302.0(13:20)
8/29	12.0	190.0(12:45)	13.0	212.0(11:30)	15.0	16.0	210.0(23:40)
8/30	10.0	221.0(13:35)	22.0	222.0(13:35)	25.0	26.0	232.0(12:30)
8/31	17.0	216.0(15:25)	20.0	216.0(15:25)	23.0	24.0	217.0(15:25)

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TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR AUG 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

RELATIVE HUMIDITY

SITE 023		RELATIVE HUMIDITY		
DATE	(8-FT)	(30-FT)	(100-FT)	(200-FT)
8/ 1	27.0(7:20)			
8/ 2	35.0(23:30)			
8/ 3	65.0(23:55)			
8/ 4	92.0(7:05)			
8/ 5	96.0(0:55)			
8/ 6	51.0(1:50)			
8/ 7	45.0(5:55)			
8/ 8	37.0(3:10)			
8/ 9	32.0(4:15)			
8/10				
8/11	51.0(5:15)			
8/12	44.0(6:30)			
8/13	44.0(4:35)			
8/14	45.0(22:55)			
8/15	100.0(23:15)			
8/16	100.0(4:25)			
8/17	93.0(21:10)			
8/18	96.0(4:30)			
8/19	97.0(4:00)			
8/20	80.0(4:25)			
8/21	69.0(23:55)			
8/22	77.0(3:55)			
8/23	63.0(1:30)			
8/24	100.0(23:50)			
8/25	100.0(0:05)			
8/26	100.0(21:00)			
8/27	100.0(0:05)			
8/28	86.0(5:35)			
8/29	72.0(1:10)			
8/30	54.0(4:10)			
8/31	61.0(5:45)			

TABLE VI
THE FIVE MAXIMUM INDEPENDENT SLIDING
AVERAGES FOR AUGUST 1 THRU 31

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TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR AUG 1-31
(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

NITROGEN OXIDES (WS: WD)
1-HOUR

SITE	023
1. 8/ 9(8:25- 9:25)	14.5(3:)
2. 8/19(5:45- 6:45)	8.1(2:214)
3. 8/10(11:05-12:05)	7.8(5:)
4. 8/10(13:15-14:15)	7.8(9:)
5. 8/19(3:45- 4:45)	7.8(2:107)

NITRIC OXIDE (WS: WD)
1-HOUR

SITE	023
1. 8/31(10:30-11:30)	7.0(5: 2)
2. 8/10(7:40- 8:40)	5.6(3:)
3. 8/10(8:45- 9:45)	5.6(3:)
4. 8/10(9:50-10:50)	5.6(6:)
5. 8/10(10:55-11:55)	5.6(5:)

NITROGEN DIOXIDE (WS: WD)
1-HOUR

SITE	023
1. 8/ 9(8:25- 9:25)	13.7(3:)
2. 8/19(5:45- 6:45)	8.1(2:214)
3. 8/19(3:45- 4:45)	7.8(2:107)
4. 8/25(21:35-22:35)	3.3(11:177)
5. 8/10(11:05-12:05)	2.2(5:)

TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR AUG 1-31
(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

SULFUR DIOXIDE (WS: WD)
1-HOUR

SITE 023

1.	8/24(11:50-12:50)	3.0(14:210)
2.	8/20(4:15- 5:15)	1.7(1:327)
3.	8/15(6:25- 7:25)	1.5(7:184)
4.	8/17(18:15-19:15)	1.5(2:146)
5.	8/19(15:55-16:55)	1.5(6:133)

SULFUR DIOXIDE (WS: WD)
3-HOUR

SITE 023

1.	8/24(10:55-13:55)	2.1(13:214)
2.	8/17(17:35-20:35)	1.1(3:156)
3.	8/20(2:20- 5:20)	.8(2:239)
4.	8/19(15:15-18:15)	.7(6:106)
5.	8/19(22:15- 1:15)	.6(1:203)

SULFUR DIOXIDE (WS: WD)
24-HOUR

SITE 023

1.	8/19- 8/20(13:00)	.4(4:305)
2.	8/23- 8/24(14:00)	.3(:)
3.	8/14- 8/15(8:00)	.1(6:204)
4.	8/21- 8/22(15:00)	.0(4:126)

TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR AUG 1-31

(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)

UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

HYDROGEN SULFIDE (WS: WD)
1-HOUR

SITE	023
1. 8/25(11:05-12:05)	20.6(12:215)
2. 8/25(9:10-10:10)	13.0(11:212)
3. 8/25(12:10-13:10)	12.4(14:209)
4. 8/25(22:50-23:50)	12.4(15:191)
5. 8/19(1:40- 2:40)	11.5(1:201)

TOTAL HYDROCARBONS (WS: WD)
3-HOUR (6-9AM)

SITE	023
1. 8/26(6:00- 9:00)	1210.5(2: 23)
2. 8/ 7(6:00- 9:00)	1206.5(5:)
3. 8/21(6:00- 9:00)	1195.5(2: 46)
4. 8/11(6:00- 9:00)	1182.6(4:)
5. 8/22(6:00- 9:00)	1132.3(1: 38)
PRIMARY STANDARD EXCEEDED 15 TIMES AT SITE 023	
SECONDARY STANDARD EXCEEDED 15 TIMES AT SITE 023	

TABLE VI. THE FIVE MAXIMUM AVERAGES FOR AUG 1-31
 (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
 UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
 WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

METHANE (WS: WD)
 3-HOUR (6-9AM)

SITE 023

1. 8/11(6:00- 9:00) 881.2(4: J
2. 8/ 8(6:00- 9:00) 852.1(7: J
3. 8/ 7(6:00- 9:00) 850.1(5: J
4. 8/13(6:00- 9:00) 829.4(4: 58J
5. 8/ 6(6:00- 9:00) 823.0(2: J

PRIMARY STANDARD EXCEEDED 15 TIMES AT SITE 023

SECONDARY STANDARD EXCEEDED 15 TIMES AT SITE 023

TABLE VI. THE FIVE MAXIMUM AVERAGES FOR AUG 1-31
 (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
 UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
 WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

NON-METHANE HYDROCARBONS[WS: WD]
 3-HOUR(6-9AM)

SITE 023

1.	8/20(	6:00-	9:00)	413.2	(	2: 23)
2.	8/21(	6:00-	9:00)	394.7	(	2: 46)
3.	8/ 7(	6:00-	9:00)	356.4	(	5: 1)
4.	8/22(	6:00-	9:00)	336.6	(	1: 38)
5.	8/24(	6:00-	9:00)	314.8	(	: 1)

PRIMARY STANDARD EXCEEDED 14 TIMES AT SITE 023

SECONDARY STANDARD EXCEEDED 14 TIMES AT SITE 023

TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR AUG 1-31
(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

CARBON MONOXIDE (WS: WD)
1-HOUR

SITE 023

1.	8/	4(	0:25-	1:25)	848.9(	:	)
2.	8/	3(	20:25-	21:25)	843.2(	:	)
3.	8/	3(	18:00-	19:00)	762.8(	:	)
4.	8/	9(	5:45-	6:45)	742.8(	1:	)
5.	8/	3(	22:25-	23:25)	737.4(	:	)

OZONE (WS: WD)
1-HOUR

SITE 023

1. 8/24(10:25-11:25) 164.1(: 1)
2. 8/24(12:35-13:35) 163.0(12:220)
3. 8/23(20:55-21:55) 152.9(: 1)
4. 8/24(14:10-15:10) 152.7(14:220)
5. 8/23(16:50-17:50) 151.2(: 1)

TABLE VI. THE FIVE MAXIMUM AVERAGES FOR AUG 1-31
UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER

PARTICULATE
24-HOUR

023

SITE

1	8/12	74.0
2	8/ 2	31.0
3	8/13	26.0
4	8/14	24.0
5	8/ 4	16.0

TABLE VII
FUNCTIONAL DEPENDENCE OF RECORDED
PARAMETERS UPON WIND DIRECTION

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

NITROGEN OXIDES(NOX) TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77) C-H SHALE OIL PROJECT

CONCENTRATION UG/M ³ GT		WIND DIRECTION																	TOTAL
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	
140 -	160 :																		:
120 -	140 :																		:
110 -	120 :																		:
100 -	110 :																		:
90 -	100 :																		:
80 -	90 :																		:
70 -	80 :																		:
60 -	70 :																		:
50 -	60 :																		:
40 -	50 :																		:
30 -	40 :									1									:
20 -	30 :									0									:
10 -	20 :									0	3	5					1		:
LT	10 :	227	145	111	107	151	191	159	195	391	509	585	160	126	165	244	252	33	3751
TOTAL	:	227	145	112	107	151	192	160	195	392	512	590	160	126	165	244	253	33	3764
.....																			
MEAN		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

II B

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

NITRIC OXIDE(NO) TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77) C-H SHALE OIL PROJECT

CONCENTRATION UG/M**3 GT 160 :		WIND DIRECTION																TOTAL	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		CALM
140 -	160 :																		:
120 -	140 :																		:
110 -	120 :																		:
100 -	110 :																		:
90 -	100 :																		:
80 -	90 :																		:
70 -	80 :																		:
60 -	70 :																		:
50 -	60 :																		:
40 -	50 :																		:
30 -	40 :																		:
20 -	30 :																		:
10 -	20 :									1	2					1		4	:
LT	10 :	227	145	112	107	151	192	160	195	392	511	588	160	126	165	244	252	33	3760
TOTAL	:	227	145	112	107	151	192	160	195	392	512	590	160	126	165	244	253	33	3764
.....																			
MEAN		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

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NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

NITROGEN DIOXIDE (NO2) C-B SHALE OIL PROJECT
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

CONCENTRATION		WIND DIRECTION																	TOTAL	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM		
UG/M**3																				
GT 160 :																				:
140 - 160 :																				:
120 - 140 :																				:
110 - 120 :																				:
100 - 110 :																				:
90 - 100 :																				:
80 - 90 :																				:
70 - 80 :																				:
60 - 70 :																				:
50 - 60 :																				:
40 - 50 :																				:
30 - 40 :																				:
20 - 50 :																				:
10 - 20 :																				:
LT 10 :		227	145	111	107	151	191	159	195	391	510	587	160	126	165	244	253	33	3755	
TOTAL :		227	145	112	107	151	192	160	195	392	512	590	160	126	165	244	253	33	3764	
MEAN		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE(SO2) TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77) C-B SHALE OIL PROJECT

		WIND DIRECTION																		
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL	
CONCENTRATION																				
UG/M**3																				
GT	140 :																			
130 -	140 :																			
120 -	130 :																			
110 -	120 :																			
100 -	110 :																			
90 -	100 :																			
80 -	90 :																			
70 -	80 :																			
60 -	70 :																			
50 -	60 :																			
40 -	50 :																			
30 -	40 :																			
20 -	30 :																			
10 -	20 :																			
																		1	1	
LI	10 :	275	183	139	128	185	258	253	306	497	678	709	206	158	186	271	307	34	4775	
TOTAL		:	275	183	139	128	185	258	253	306	497	679	709	206	158	186	271	307	34	4774
																				
MEAN		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

HYDROGEN SULFIDE (H₂S) TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77) C-B SHALE OIL PROJECT

CONCENTRATION UG/M**3 GT 140 :		WIND DIRECTION																	TOTAL	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM		
130 -	140 :																		:	
120 -	130 :																		:	
110 -	120 :																		:	
100 -	110 :																		:	
90 -	100 :																		:	
80 -	90 :																		:	
70 -	80 :																		:	
60 -	70 :																		:	
50 -	60 :																		:	
40 -	50 :																		:	
30 -	40 :																		:	
20 -	30 :									7	4								:	
10 -	20 :																		:	
LT	10 :	259	166	125	122	159	210	192	215	380	559	615	178	130	179	259	282	34	: 4064	
TOTAL	:	259	169	125	123	162	217	195	221	407	599	654	182	133	180	261	285	34	: 4206	
.....																				
MEAN		1.	1.	1.	1.	2.	2.	1.	2.	3.	1.	2.	1.	0.	0.	2.	1.	0.	2.	

II B

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

METHANE (CH4) C-B SHALE OIL PROJECT
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

CONCENTRATION UG/M**3 GT 2400 :		WIND DIRECTION																TOTAL	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		CALM
2200 - 2400 :																			:
2000 - 2200 :																			:
1800 - 2000 :																			:
1600 - 1800 :																			:
1400 - 1600 :																			:
1200 - 1400 :																			:
1000 - 1200 :																			:
800 - 1000 :	146	96	67	50	62	87	104	111	118	325	349	113	73	84	124	138	15	2062	
600 - 800 :	73	65	52	47	79	96	72	86	253	230	273	72	63	59	74	92	14	1700	
400 - 600 :	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	
200 - 400 :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
LT 200 :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL :	219	161	119	97	141	183	178	197	371	555	623	186	137	143	198	230	29	5767	
.....																			
MEAN		808. 807. 805. 803. 799. 801. 810. 804. 794. 802. 807. 804. 802. 804. 802. 804. 805. 807. 803.																	

MEAN

808. 807. 805. 803. 799. 801. 810. 804. 802. 794. 802. 807. 804. 802. 804. 806. 807. 803.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

NON-METHANE HYDROCARBONS
 TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77) C-B SHALE OIL PROJECT

CONCENTRATION UG/M**3 GT 3000 :	WIND DIRECTION																	TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	
2800 - 3000 :																		:
2600 - 2800 :																		:
2400 - 2600 :																		:
2200 - 2400 :																		:
2000 - 2200 :																		:
1800 - 2000 :																		:
1600 - 1800 :																		:
1400 - 1600 :																		:
1200 - 1400 :																		:
1000 - 1200 :								1										:
800 - 1000 :								0										:
600 - 800 :								1			1	1	3					:
LT 600 :	219	161	119	97	141	183	178	195	371	555	622	185	134	143	198	230	29	: 5760
TOTAL :	219	161	119	97	141	183	178	197	371	555	623	186	137	143	198	230	29	: 3767
.....																		

MEAN 283. 292. 294. 291. 295. 310. 305. 297. 287. 270. 273. 273. 274. 285. 293. 275. 305. 284.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

CARBON MONOXIDE(CO) TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77) C-B SHALE OIL PROJECT

CONCENTRATION UG/M**3 GT 4250 :	WIND DIRECTION																	TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	
3750 - 4000 :																		:
3500 - 3750 :																		:
3250 - 3500 :																		:
3000 - 3250 :																		:
2750 - 3000 :																		:
2500 - 2750 :																		:
2250 - 2500 :																		:
2000 - 2250 :																		:
1750 - 2000 :										1								:
1500 - 1750 :						1				0								:
1250 - 1500 :						2				0				1				:
LT 1250 :	236	168	123	100	143	193	184	207	386	569	634	188	141	145	219	261	30	3927
TOTAL :	236	168	123	100	146	193	184	207	386	569	635	188	142	145	219	261	30	3932
.....																		
MEAN	190.	196.	194.	200.	228.	193.	208.	194.	193.	217.	217.	209.	220.	209.	190.	187.	189.	204.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

		C-B SHALE OIL PROJECT																	
		TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)																	
		WIND DIRECTION																	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
CONCENTRATION																			
UG/FT**3																			
GT 240 :																			
220 -	240 :																		:
200 -	220 :																		:
180 -	200 :																		:
160 -	180 :																		:
140 -	160 :	1				2			2	24	63	77	7	3	1	8	2		190
120 -	140 :	60	15	27	15	35	39	32	54	168	62	55	15	4	26	57	70	1	735
100 -	120 :	81	46	24	32	28	37	31	59	117	171	180	82	69	64	109	105	4	1239
80 -	100 :	50	34	37	42	47	63	76	70	112	225	181	37	27	39	40	49	4	1133
60 -	80 :	58	66	35	29	44	60	58	61	49	88	101	44	51	39	38	65	10	896
40 -	60 :	20	20	11	9	18	37	49	47	30	57	91	39	32	24	15	14	10	523
20 -	40 :	1	2	6	2	5	4	4	2	3	12	29	6	2	0	0	0	2	80
LT	20 :	0	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	3	6
TOTAL :		271	183	140	129	179	240	250	295	503	687	716	231	188	193	267	305	34	4811
MEAN		98.	87.	90.	91.	90.	87.	83.	91.	106.	98.	94.	89.	87.	94.	104.	101.	64.	95.

TABLE VIII
DIURNAL VARIATION OF VARIOUS RECORDED PARAMETERS

DIURNAL VARIATION OF NITROGEN OXIDES(UG/M**3)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0
5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3
7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4
8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3
9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4
11	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3
12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4
14	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3
15	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4
17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3
18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4
20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3
21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4
23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3
24	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4
26	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4
29	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3
30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

TOTAL NUMBER OF OBSERVATIONS = 7031. MEAN = 1.

* DENOTES A VALID SAMPLE BELOW THE MINIMUM DETECTABLE LIMIT OF THE INSTRUMENT

: INDICATES CALIBRATION DURING THE HOUR

NOV 23 1966

TOTAL NUMBER OF OBSERVATIONS = 7039. MEAN = 1.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF NITROGEN DIOXIDE(UG/M**3)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9	*	*	*	*	*	*	*	*	14:	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
24	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
26	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
28	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
29	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
30	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL NUMBER OF OBSERVATIONS = 7031. MEAN = 0.

* DENOTES A VALIO SAMPLE BELOW THE MINIMUM DETECTABLE LIMIT OF THE INSTRUMENT

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF SULFUR DIOXIDE (UG/M**3)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL NUMBER OF OBSERVATIONS = 8467. MEAN = 0.

: INDICATES CALIBRATION DURING THE HOUR

JOURNAL VARIATION OF HYDROGEN SULFIDE(UG/M**3 X 10**-1)
 TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																								MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	9	10	11	0	0	0	0	7	6	2	0	0	0	0	0	0	0	0	0	1	0	0	3	7	2
19	0	0	0	0	0	1	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
20	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
21	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
23	7	8	9	9	9	10	10	9	8	3	2	6	3	2	0	0	0	0	0	0	0	0	0	0	0
24	8	8	8	8	10	8	9	8	8	12	15	20	15	5	0	0	3	0	1	5	6	8	9	12	7
25	5	4	4	5	4	4	5	3	2	1	0	0	0	0	0	0	0	0	2	4	5	6	7	3	3
26	5	5	6	5	6	6	5	7	7	4	0	3	3	2	0	0	1	0	0	0	0	0	0	0	0
27	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEAN	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL NUMBER OF OBSERVATIONS = 7677. MEAN = 1.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF TOTAL HYDROCARBONS(UG/M**3 X 10**--1)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	113	112	113	113	114	114	117	119	106	106	106	103	106	109	111	114	114	115	116	115	112	112	111	111	112
2	109	108	107	107	107	107	108		:104	106	115	115	108	107	110	109	106	106					112		108
3	100	111	112		108										100	104									110
4			112	109	109	108	109	100	97	108	106				:101:102	105	107	107	107	109	110	106	105	107	106
5	109	109	108	104	105	104	104	104		: 90	97	103	110	113	110	103	107	103	104	100	102	103	104	107	105
6	108	108	106	106	106	107	107	105	106	112	117	122	125	125	124	123	123	119	117	117	117	116	116	116	115
7	112	113	115	115	116	116	116	121	124	125	120	121	121	119	118	117	117	119	119	117	117	115	115	116	118
8	119	117	116	112	113	114	114	117	104				104			96									112
9	115	114	111	108	104	103	106	108		: 97	101	107	107	108	111	112	112	111	110	112	113	116	114	111	109
10	109	109	109	109	109	108	108		98	106	103	104	107		:104	105	107	107	109	111	112	114	114	113	108
11	113	113	113	113	113	113	114	119	120	107	109	112	109	97	100	106	111	113	113	112	112	113	112	113	111
12	113	112	111	112	107	91	90	89	90		: 86:	89	97	99	105	102	104	106	106	108	107	106	104	108	102
13	97	100	103	103	104	106	107	113	117	119	121	126	106												109

14																									
15																									
16																									
17	131	128	126	125	124	123	123	122	99		97	97	99	98	97										113
18		107			106	118	106	109	107	90	94	98	115	102	112	:126	106	106	110	110	99	99	111	100	106
19	111	112	113		:115	117	118		102	103		95	95	98	93	98	105	108	113	117	120	116	116	117	109
20	117	117	117	117	116	117	118	120	123	126	105	98	96	96	104	109	111	114	115	115	115	115	117	118	113
21	118	117	115	115	115	115	117	120	121	123	121	120	120	121	121	121	118	117	115	114	113	114	113	113	117
22	113	112	112	112	112	112	114	117	107	96	103	108	110	100	101	105	109	112	113	113	114	112	111	111	110
23	112	111	111	112	113	113	114	108						: 98	97	97	92	99	104	106	109	109	110	110	107
24	110	112	112	112	113	113	113	109	105	100	93	95	99	102	93	96	99	102	104	104	104	104	105	106	105
25	106	107	109	108	107	107	108	109	108	92	92	91	93	100	104	106	107	109	109	109	109	109	108	109	105
26	108	105	104	105	105	105	106							108	103	105	107	111	111	107	105	106	108	102	106
27	100	100	101	101	101	102	100	102	105	109	112	113	113	110	112	111	110	109	108	107	105	104	104	103	106
28	104	104	104	104	105	104	105	106	111	115	119	118	118	119	116	114	114	113	110	109	108	107	106	104	110
29	105	104	105	105	105	105	105	107	:101	105	108	109	107	108	109	110	110	110	110	108	107	106	106	106	107
30	106	105	105	105	105	105	106	107	111	98	98	102	104	105	106	105	105	106	105	101	102	104	104	104	104
31	107	105	104	106	107	108	109	111	115	113	104	100	105	108	109	111	116	110	107	106	108	111	113	111	108
MEAN	110	110	110	110	109	110	110	111	109	107	106	106	107	107	107	107	110	110	110	110	110	110	110	110	110

TOTAL NUMBER OF OBSERVATIONS = 6840. MEAN = 109.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF METHANE(UG/M**3 X 10**+1)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	86	87	87	87	86	86	87	85	88	88	86	86	86	86	86	85	85	85	85	86	85	85	86	85	86
2	85	85	85	85	85	85	84	:	85	86	88	87	85	84	89	92	86	89	84	85	85	115	88	88	86
3	85	84	85	91	86										83	90									90
4			91	91	91	78	84	80	83	83	94			:											86
5									:	82	84	86	87	87	84	84	83	84	85	84	86	81	81	83	84
6	83	82	82	83	83	83	83	81	82	82	90	105	90	88	88	84	87	84	83	85	88	89	84	84	86
7	84	84	85	85	84	85	85	84	85	85	84	85	85	85	85	85	86	88	87	86	85	85	85	85	85
8	86	85	85	85	85	85	85	85	85	85			85			84			81	81	83	84	87	87	85
9	88	88	86	86	84	84	95	83	:	82	84	93	92	82	84	82	82	82	81	81	83	84	85	86	83
10	83	86	83	82	82	82	81		81	85	83	81	83		:	82	81	82	83	83	84	85	85	86	83
11	86	86	86	86	86	86	86	88	89	88	85	85	85	84	85	85	85	85	85	85	85	85	85	85	86
12	85	85	85	85	84	82	80	80	80	:	78:	78	79	78	80	80	80	80	81	80	80	80	80	82	81
13	80	80	81	81	81	82	82	83	83	84	84	86	80												82
14								:																	
15																									
16																									
17	83	82	82	81	81	81	81	81	82		82	83	83	83	84		80	78	78	83	78	79	83	83	82
18	78	83	78	:	83	82	82	82	82	82	82	82	84	83	82	79	80	80	81	83	85	80	79	76	81
19	79	79	79	79	79	79	79	79	80	81	81	81	80	79	80	81	80	81	80	80	79	79	79	79	80
20	80	80	80	79	79	79	79	80	80	81	80	80	79	78	79	80	78	83	80	79	79	80	79	80	80
21	79	79	79	78	79	81	79	79	74	79	79	80	80	81	82	82	81	81	81	80	80	79	79	79	80
22	79	79	79	79	79	79	79	79	77	77	77	80	80	78	79	76	77	79	78	77	78	77	77	77	78
23	76	77	77	77	77	77	77	77	77	77	77	77	77	78	77	77	78	77	77	77	78	77	77	77	78
24	77	78	79	78	78	78	77	78	77	77	78	77	77	78	78	79	78	78	78	78	78	77	77	77	78
25	77	77	77	77	77	78	78	78																	79
26	78	79	79	79	79	78	78	78	78	78	79	78	79	79	79	79	79	82	81	80	79	79	82	79	79
27	79	79	79	79	79	79	80	79	79	81	82	81	80	80	79	79	79	79	79	81	80	80	79	79	79
28	80	80	81	81	81	80	80	80	:	83	82	83	82	82	81	80	80	80	80	81	81	80	79	79	80
29	80	79	80	79	79	79	79	78	79	80	80	80	80	80	79	79	79	79	79	79	79	80	80	81	81
30	80	79	80	79	79	79	79	78	79	80	80	80	80	80	79	79	79	79	79	79	79	80	79	80	79
31	80	80	80	81	82	81	82	82	81	82	82	81	81	81	80	81	80	81	80	80	80	81	81	80	81
MEAN	81	82	82	82	82	81	81	81	82	82	83	83	83	82	81	82	81	81	81	81	81	82	81	81	81

TOTAL NUMBER OF OBSERVATIONS = 6625. MEAN = 82.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF NON-METHANE HYDROCARBONS(UG/M**3 X 10**-1)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	26	25	26	26	27	27	31	33	18	18	20	16	20	23	26	29	28	29	31	29	28	27	26	26
2	25	23	22	22	22	22	24	;	19	21	26	28	24	23	20	17	20	17						24
3	14	27	27	21	18	30	25	20	14	25	13				17	14					14			
4																								
5																								
6	25	25	23	24	24	23	24	23	24	30	26	17	34	37	36	40	36	35	34	32	28	26	32	23
7	28	29	30	30	31	31	32	36	39	39	35	36	36	34	33	32	31	31	31	32	30	30	30	31
8	33	31	30	27	28	29	29	32	19				18			12					23	27	27	
9	27	26	25	23	20	19	11	25	;	15	17	13	15	26	26	30	30	29	29	30	30	31	27	25
10	26	25	26	26	28	26	26		17	21	20	22	24			22	24	25	27	28	29	28	28	
11	27	27	27	27	27	27	28	31	31	20	24	26	24	13	15	21	25	27	28	28	27	28	27	28
12	28	26	27	27	22	9	10	8	10	;	8	11	18	21	25	22	24	26	26	27	27	26	23	26
13	16	19	22	22	24	25	25	30	33	35	36	40	26											
14																								
15																								
16																								
17	48	45	44	44	42	42	42	41	17		15	14	16	15	13									
18	32	24			23	36	23	27	25	8	12	15	31	19	30		46	28	27	26	20	20	28	16
19	38	38	35	37	35	37	38		23	23		16	16	20	15	18	25	28	32	35	35	36	29	34
20	38	36	35	35	35	35	37	41	44	45	23	17	16	17	24	28	31	34	35	35	35	35	37	37
21	34	33	34	34	33	31	34	40	41	41	40	39	41	42	42	41	40	33	34	35	34	34	34	34
22	35	33	32	33	33	34	35	38	28	17	23	28	30	19	19	23	28	31	33	33	33	33	31	32
23	34	35	35	35	36	36	35	29		22	16					21	16	20	25	29	30	32	32	33
24	29	29	30	30	29	29	30	31	31	15	14	14	16	22	26	18	21	25	26	26	26	27	27	28
25	30	27	27	27	28	27	29									26	28	29	30	28	27	27	26	23
26	21	22	22	21	22	23	22	23	27	31	33	34	34	31	33	32	31	30	29	27	25	24	24	24
27	25	25	25	25	25	25	25	27	31	34	36	36	37	38	36	35	34	33	31	27	27	27	26	25
28	25	24	23	24	24	24	24	27		18	22	25	27	25	28	29	30	30	30	28	27	25	26	25
29	26	26	25	26	25	25	26	28	31	18	18	22	24	25	26	26	26	26	25	21	23	24	24	24
30	26	26	24	25	25	26	27	29	33	31	22	19	23	27	29	30	30	29	27	26	29	30	31	31
31	29	29	28	28	28	28	28	30	27	25	23	23	25	25	26	26	29	28	29	29	28	28	29	28
MEAN																								

TOTAL NUMBER OF OBSERVATIONS = 6625. MEAN = 28.

: INDICATES CALIBRATION DURING THE HOUR



DIURNAL VARIATION OF CARBON MONOXIDE(UG/M**3 X 10**-1)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																								MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1	14	14	14	14	13	13	13	16	25	24	23	23	23	23	22	22	22	23	21	22	22	21	20	18	19
2	20	22	21	19	17	18	19	:	23	22	23	22	23	23	27	28	28	30	32	27	26	26	25	24	25
3	23	24	33	35	33	27	26	42	41	22	23	22	23	23	38	57	57	71	62	74	65	80	81	73	70
4	79	73	51	41	48	31	33	42	42	54	49	48	56	62:	39:	23	23	21	21	21	22	21	21	21	21
5	22	21	22	21	20	21	21	21	:	21	22	24	41	40	26	22	22	23	28	39	39	46	32	40	34
6	33	34	35	35	35	35	35	33	35	36	41	50	56	37	47	37	37	30	35	30	29	37	31	28	36
7	29	29	29	29	27	29	27	28	29	29	28	28	27	27	25	26	26	25	26	25	24	24	24	24	27
8	24	24	25	24	23	24	23	23	21	19	24	25	25	25	25	23	23	24	24	23	23	23	23	22	23
9	23	24	24	24	24	30	67	31	42:	23	31	42	26	23	26	21	21	19	19	19	20	20	21	31	27
10	19	22	20	18	19	20	19	25	20	21	20	31	29	25	:	29	28	28	28	29	27	28	28	26	24
11	26	27	27	29	26	26	29	25	27	26	30	25	25	24	22	25	25	24	25	24	24	24	24	22	25
12	23	22	23	21	23	23	22	20	20	:	:	13	17	13	15	14	14	13	14	14	14	13	15	15	17
13	16	16	16	17	17	18	17	18	18	18	19	19	19	15	16	15	15	15	16	16	16	16	16	16	15
14																									
15																									
16																									
17	25	24	24	23	24	24	22	20	21	15	19	18	18	19	17	18	18	22	19	18	21	35	18	19	21
18	18	18	18	:	17	16	16	17	16	17	16	18	21	18	15	18	19	19	21	20	20	20	19	23	20
19	17	18	18		18	18	16	18	18	17	19	18	20	16	19	18	18	17	17	18	17	17	18	18	18
20	18	18	17	16	15	15	16	20	18	18	17	18	21	16	17	17	17	19	26	16	16	16	38	16	20
21	15	15	14	15	15	15	16	16	21	16	16	16	17	18	16	16	16	16	16	15	14	13	14	14	16
22	14	12	13	13	13	13	13	14	21	22	24	24	28	28	21	22	22	21	30	28	21	22	20	17	19
23	18	19	19	20	19	20	20	24	21	26	21	33	25	26	27	24	22	23	24	22	23	21	19	19	22
24	21	21	19	22	19	19	20	19	21	26	21	33	25	26	27	17	16	16	19	17	17	18	20	17	17
25	18	19	18	18	16	17	22	18	17	16	18	17	16	18	17	16	16	17	17	18	17	18	17	17	18
26	16	19	19	19	18	17	18	18	17	16	18	17	16	16	17	16	16	18	17	18	17	17	17	17	17
27	18	19	18	19	22	27	20	22	21	19	20	19	23	22	27	21	21	20	20	18	17	17	17	17	17
28	18	19	18	19	22	27	20	22	21	19	20	19	23	22	27	21	21	20	20	23	21	21	22	23	21
29	24	26	25	25	23	23	22	21	:	30	28	26	27	27	23	25	25	23	23	24	22	22	22	24	25
30	23	23	23	22	23	21	21	22	22	24	25	24	23	23	23	22	22	23	23	25	22	23	22	24	25
31	23	25	24	25	26	27	27	23	25	25	25	23	24	23	23	24	23	25	25	23	23	22	26	28	25
MEAN	23	23	22	22	22	22	23	23	24	24	24	25	26	24	23	23	23	24	24	25	24	24	25	24	23
TOTAL NUMBER OF OBSERVATIONS = 7531. MEAN = 24.																									

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF OZONE (UG/M**3)
TRAILER NO. - 23 PELOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	86	88	93	92	79	87	77	71	91	102	108	112	114	114	113	110	109	106	103	98	86	91	97	93
2	89	88	92	94	89	90	76	71	88	93	94	93	92	91	91	94	95	95	90	84	78	77	85	79
3	76	66	70	70	71	72	61	67	82	90	94	95	94	97	98	100	99	98	105	102	102	95	96	88
4	89	87	88	86	94	92	78	88	103	109	116	117	119	114	112	113	118	116	115	110	91	104	98	96
5	85	64	56	47	40	55	57	73	97	100	102	110	112	111	119	123	127	119	115	109	99	74	57	59
6	55	50	45	47	43	50	45	50	80	92	101	118	124	129	129	126	125	123	120	110	95	102	76	79
7	76	84	90	95	95	91	89	90	123	130	126	124	123	121	120	116	112	107	105	97	91	92	93	94
8	85	86	85	80	84	80	79	87	93	95	108	110	107	107	112	108	112	118	119	112	105	98	95	97
9	98	93	89	83	93	89	86	90	100	113	118	117	117	116	115	115	115	114	110	108	99	96	93	90
10	93	95	90	92	92	93	81	31	98	102	111	116	110	105	108	111	111	112	110	103	93	92	86	78
11	71	67	66	64	63	64	62	60	71	84	103	115	115	116	114	114	115	110	108	98	92	94	98	94
12	94	88	98	95	97	95	84	81	97	103	106	110	111	110	111	112	110	105	101	101	101	97	94	94
13	95	98	104	102	101	101	94	89	95	110	111	112	113	112	114	110	113	117	113	107	98	97	92	100
14	100	100	102	106	99	98	93	97	105	109	107	109	110	108	108	111	112	112	104	104	100	95	82	86
15	93	85	81	87				95	97	97	103	110	114	112	107	113	115	101	83	72	77	88	76	61
16	64	67	54	55	40	46	55	63	96	107	109	115	118	113	108	114	114	112	105	97	97	94	85	90
17	92	93	91	94	84	75	76	67	75		111	95	92	102	104	100	90	88					56	57
18	50	60	58	60	47	48	46	44	52	55	59	59			66	69	71	71	81	72	68	63	57	47
19	42	38	40	36	40	42	28		67	71	74	71	69	70	69	69	71	72	70	59	50	45	44	44
20	41	46	43	43	45	47	41	47	64	71	74	74	72	72	73	70	71	86	88	75	67	70	62	58
21	66	60	66	75	74	75	67	72	85	83	83	88	91	93	92	89	89	84	81	71	62	69	70	64
22	62	64	61	56	57	60	60	57	62	75	94	96	91	95	93	91	89	90	90	77	73	85	75	68
23	67	65	68	78	78	80	65	62							90	94		150	148	141	147	152	148	145
24	142	144	144	145	134	137	146	154	155	161	163	163		161	153	145	145	150	145	140	134	132	129	129
25	128	122	125	128	124	123	111	109	117	130	139	141	143	144	144	145	148	146	143	138	136	138	133	131
26	130	128	126	126	125	126	129						129	129	120	119	122	125	126	123	117	120	125	125
27	127	125	127	123	117	112	110	111	118	124	126	132	131	134	135	135	136	133	126	124	102	102	104	98
28	103	96	108	99	99	93	102	103	128	130	132	133	136	135	136	134	135	133	130	127	120	120	116	119
29	116	107	114	113	119	121	116	114		102	113	109	104	102	97	94	98	104	97	86	84	84	82	86
30	83	83	82	72	66	82	80	78	102	102	101	95	86	83	87	85	85	81	77	72	69	66	65	66
31	57	57	58	54	48	45	50	59	62	69	76	86	106	119	119	107	102	103	104	95	90	101	103	97
MEAN	85	84	84	85	81	82	78	79	93	101	107	107	108	110	108	108	109	109	107	100	94	94	90	87

TOTAL NUMBER OF OBSERVATIONS = 8513. MEAN = 96.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND SPEED AT 8 FEET(MPH)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	2	5	2	5	2	1	3	2	3	4	5	7	5	9	11	11	11	5	4	2	3	3	2	3	5
2	5	2	4	2	1	2	1	2	2	4	5	5	5	6	8	8	8	7	3	4	4	2	4	4	4
3	2	5	3	2	2	3	1	3	1	2	4	13	16	15	15	15	13	11	5	3	5	3	3	5	1
4	2	5	4	2	2	2	1	3	7	9	11	14	14	12	8	6	9	10	8	5	5	4	3	2	2
5	2	1	3	2	2	3	0	2	3	3	6	6	7	7	7	5	7	7	6	3	2	3	2	3	2
6	1	3	3	3	2	1	3	3	3	4	4	4	6	6	6	6	10	2	7	2	2	5	2	2	2
7	3	2	2	2	1	2	2	3	3	4	5	6	6	7	7	6	7	8	4	3	1	2	2	2	2
8	2	3	2	2	2	1	2	3	4	4	4	6	6	7	7	4	4	4	4	4	4	4	4	4	4
9	1	3	3	3	2	1	2	3	4	4	5	6	6	6	6	3	3	6	2	2	5	2	2	2	2
10	2	2	3	3	2	1	2	3	4	4	10	9	8	9	11	8	8	6	4	2	1	4	2	2	2
11	2	2	2	2	2	1	2	3	7	10	3	3	4	5	4	6	9	2	3	9	1	4	2	2	2
12	2	2	2	2	2	1	2	3	2	2	4	11	7	6	10	7	7	4	4	3	5	2	2	2	2
13	2	2	2	2	2	1	2	3	4	4	5	6	6	7	8	7	6	4	4	2	1	2	2	2	2
14	2	2	2	2	2	1	2	3	4	4	10	9	8	9	11	8	8	4	2	2	4	2	2	2	2
15	2	2	2	2	2	1	2	3	7	10	3	3	4	5	4	6	9	6	2	4	5	2	2	2	2
16	2	2	2	2	2	1	2	3	2	2	4	11	7	6	10	8	7	2	1	5	1	4	2	2	2
17	2	2	2	2	2	1	2	3	2	2	4	6	6	7	8	8	9	7	3	2	5	2	2	2	2
18	2	2	2	2	2	1	2	3	2	2	4	8	8	7	10	8	7	7	2	2	1	4	2	2	2
19	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	3	1	2	1	3	2	2	2
20	2	2	2	2	2	1	2	3	2	2	4	8	8	7	10	8	7	6	4	3	2	2	2	2	2
21	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	5	4	4	2	6	5	4	4
22	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	7	4	4	2	6	5	4	4
23	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	5	4	4	2	6	5	4	4
24	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	10	7	4	7	6	4	2	2
25	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	10	7	4	7	6	4	2	2
26	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	10	7	4	7	6	4	2	2
27	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	10	7	4	7	6	4	2	2
28	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	10	7	4	7	6	4	2	2
29	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	10	7	4	7	6	4	2	2
30	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	10	7	4	7	6	4	2	2
31	2	2	2	2	2	1	2	3	2	2	4	6	6	7	9	8	7	10	7	4	7	6	4	2	2
MEAN	3	2	3	3	2	2	2	2	3	5	6	7	8	8	9	9	8	8	6	5	4	4	3	3	3

TOTAL NUMBER OF OBSERVATIONS = 7742. MEAN = 5.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND SPEED AT 30 FEET(MPH)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	4	3	3	2	4	4	3	3	4	4	7	9	7	13	14	15	16	7	5	4	4	5	4	5	5
2	8	5	6	3	4	4	3	3	3	5	7	6	7	8	10	10	11	10	6	8	7	4	5	6	6
3	4	2	5	5	4	4	3	4	9	12	13	16	20	19	18	19	16	15	12	8	5	2	6	6	6
4	8	6	7	4	4	3	3	8	11	12	14	18	18	15	15	9	12	12	8	7	8	6	7	9	9
5	3	4	5	3	3	4	1	2	3	4	7	8	7	10	9	11	10	10	8	6	3	4	3	2	2
6	1	2	3	3	3	2	1	4	4	4	6	5	8	8	9	8	7	4	8	6	6	7	4	3	3
7	5	5	4	5	4	3	4	4	3	5	4	8	8	10	6	7	12	9	4	3	2	3	2	4	4
8	3	4	3	3	2	4	2	4	5	5	6	7	11	4	5	5	6	6	7	7	6	5	4	3	3
9	3	3	2	2	4	3	3	8	9	13	13	11	8	12	15	11	4	6	3	13	6	4	5	4	1
10	3	2	3	3	3	2	3	2	3	3	4	5	5	7	10	8	10	8	6	4	2	3	2	4	4
11	3	5	4	3	5	3	3	4	5	13	4	14	8	6	5	5	6	6	7	7	6	5	4	3	3
12	3	2	3	3	3	4	3	2	2	9	4	15	9	9	13	9	9	8	4	2	6	5	3	2	2
13	3	3	3	4	3	3	2	2	3	3	15	8	9	6	5	9	6	4	4	7	6	5	5	4	1
14	4	2	5	6	5	4	3	2	1	9	4	14	8	6	5	5	6	8	8	6	2	5	5	3	3
15	6	5	3	5	3	3	2	2	5	3	4	5	9	9	12	11	8	3	6	4	6	5	5	2	3
16	3	2	3	3	2	1	1	2	2	3	5	8	11	8	5	7	8	8	1	3	3	1	2	2	3
17	3	2	3	3	3	1	1	2	2	3	5	8	8	8	5	9	6	4	4	7	6	5	4	4	4
18	3	2	3	3	4	1	1	2	2	3	5	8	9	9	10	8	9	11	10	10	8	4	4	4	4
19	2	2	2	2	4	1	1	2	2	3	5	8	9	9	12	11	10	7	7	7	6	5	5	4	3
20	2	0	2	2	1	1	1	2	2	3	5	8	8	8	5	9	9	8	8	6	2	3	2	2	3
21	7	4	3	3	3	2	1	2	1	3	5	5	4	4	6	8	8	8	5	3	3	1	3	3	3
22	3	2	3	3	3	2	1	1	0	3	5	6	6	7	6	8	6	6	7	5	2	4	5	3	3
23																									
24																									
25	7	6	7	6	4	7	2	3	4	9	11	12	14	12	13	12	12	12	10	10	8	5	4	6	6
26	16	12	11	11	11	10	11							14	15	15	14	12	9	7	10	10	11	15	15
27	3	2	6	5	3	2	3	3	2	2	2	4	7	20	7	8	3	10	11	10	9	6	6	6	6
28	3	3	2	2	3	3	3	3	3	4	4	5	9	10	9	7	9	3	3	3	2	1	2	2	2
29	4	5	2	2	1	1	1	1	3	6	9	11	11	10	9	9	9	9	8	7	4	4	2	4	4
30	3	3	1	3	3	4	4	3	14	15	14	14	16	19	18	16	16	13	10	9	10	3	3	2	2
31	6	6	4	4	3	4	2	1	2	4	5	5	8	12	13	16	15	11	7	5	5	8	10	10	10
MEAN	5	4	4	4	3	3	3	3	4	6	7	9	10	10	11	10	10	9	7	6	5	5	4	4	4

TOTAL NUMBER OF OBSERVATIONS = 7221. MEAN = 7.

: INDICATES CALIBRATION DURING THE HOUR

JOURNAL VARIATION OF WIND SPEED AT 100 FEET(MPH)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																								
2																								
3																								
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27																								
28																								
29																								
30																								
31																								
MEAN																								

TOTAL NUMBER OF OBSERVATIONS = 7174. MEAN = 8.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND SPEED AT 200 FEET (MPH)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

HOUR

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 MEAN

DAY

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MEAN

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4

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4

TOTAL NUMBER OF OBSERVATIONS = 7721. MEAN = 8.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION AT 8 FEET
TRAILER NO. - 25 PERIOD(8/ 1/77 TO 8/31/77)

HOUR

DAY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 MEAN

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MEAN

218	187	199	187	210	83	111	65	23	1	352	62	13	312	320	330	328	301	245	237	226	192	165	149	220	265
312	329	209	188	214	265	167	132	194	244	4	305	335	360	20	341	355	354	348	343	325	216	214	146	256	317
183	298	78	159	115	104	120	204	202	202	198	216	199	247	330	268	179	360	295	218	172	140	195	175	167	253
162	116	142	143	239	136	128	72	181	186	63	136	213	268	235	195	173	185	173	173	172	183	160	89	128	161
129	126	131	164	216	217	127	28	117		246	205	213	221	306	333	353	158	149	144	12	147	142	192	168	
168	126	144	158	96	138	118	81	199	223	235	278	351	314	247	264	266	245	278	265	291	264	256	238	230	
257	224	214	229	104	186	191		43	345		333	354	2	13	30	131	91	320	342	235	222	242	185	268	
225	162	203	227	250	230	287	68	328	339	345	323	340	344	315	209	238	34	99	181	299	221	258	211	266	
202	136	150	161	200	237	55	79	322	332	307	233	112	24	325	325	219	138	181	142	106	84	118	111	142	
120	188	200	224	255	178	118	54	20	1	320	356	360	330	310	296	305	305	302	220	257	94	163	215	281	
134	110	179	195	113	177	59	64						178	206	208	220	231	224	227	197	215	62	127	173	
126	92	155	193	173	176	177	183	169	190	204	203	213	212	218	197	201	217	189	166	93	96	86	277	178	
148	37	318	152	95	193	16	208	103	202	214	208	207	210	220	216	216	218	214	188	178	175	173	185	190	
181	169	169	173	175	175	173							203	218	315	333	350	344	331	320	324	359	77	241	
143	189	154	113	11	99	145	74	67	41	68	185	207	182	194	188	211	52	356	68	214	249	204	63	137	
239	151	139	284	232	199	155	76	320	323	338	330	318	307	311	307	323	348	351	103	173	191	227	222	276	
249	197	229	20	303	252	98	21	26	111	215	208	211	225	223	223	215	222	213	213	218	42	27	142	216	
135	171	178	211	94	164	109	42	196	210	214	210	224	225	219	223	229	228	220	207	206	280	245	228	203	
294	289	276	286	252	241	184	311	8	9	5	344	254	230	223	231	227	218	231	215	216	203	192	186	249	
183	160	177	187	188	183	130	73	69	289	300	255	266	267	265	266	246	251	254	198	204	193	175	181		

TOTAL NUMBER OF OBSERVATIONS = 5420. MEAN = 206.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION AT 30 FEET
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

HOUR

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 MEAN

DAY

1	218	194	174	174	157	206	344	103	61	18	350	333	336	277	301	311	328	321	295	242	232	224	193	152	128	197	261
2	314	332	212	177	212	267	162	128	128	194	244	352	333	58	6	306	245	348	346	341	335	325	207	183	114	213	318
3	172	241	82	174	111	114	151	203	201	201	201	196	214	197	244	323	264	181	329	297	296	167	130	194	163	164	250
4	162	111	130	131	241	129	130	72	185	186	186	56	135	214	265	234	194	173	184	171	167	183	173	93	128	160	
5	127	122	128	155	196	215	128	34	164			244	200	207	218	239	298	346	156	150	148	1	148	152	190	172	
6	163	132	148	161	102	137	117	92	203	217	230	3	353	354	4	18	36	267	248	278	265	291	264	255	229	218	
7	236	214	198	209	94	158	200		33	353		334	354						97	287	353	244	221	231	168	238	
8	219	212	188	215	287	218	246	76	335	352	347	325	343	347	316	210	240	35	101	170	246	220	250	206	256	256	
9	190	138	153	160	195	211	62	80	309	327	305	227	117	7	325	328	218	218	146	182	145	121	88	116	130	152	
10	122	179	179	194	281	174	127	51	5	339	325	350	360	330												350	
11																											
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22																											
23																											
24																											
25	156	56	319	154	98	191	23	208	106	203	218	215	212	216	225	222	222	222	226	221	196	185	182	179	192	187	
26	186	173	173	175	176	174	176																				194
27	150	194	158	122	17	116	153	80	72	48	87	181	210	185	197	192	208	56	358	348	336	325	330	2	83	245	
28	241	142	131	278	225	223	165	137	317	325	335	333	312	312	312	306	324	352	356	69	183	221	201	72	141	141	
29	256	194	205	319	58	302	122	43	32	108	215	211	213	227	224	226	217	222	214	208	203	66	42	157	203	276	
30	185	170	139	189	115	162	111	84	198	213	218	213	225	226	220	225	230	230	224	210	208	278	245	227	202	202	
31	299	294	281	299	266	240	185	255	360	15	4	346	258	230	225	232	231	221	233	206	199	200	193	188	248	248	
MEAN	193	174	167	181	180	188	140	89	21	303	302	269	265	263	261	263	245	244	249	190	191	186	176	176	176	176	

TOTAL NUMBER OF OBSERVATIONS = 4935. MEAN = 205.

: INDICATES CALIBRATION DURING THE HOUR

TOTAL NUMBER OF OBSERVATIONS =	2062.	MEAN =	194.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION AT 200 FEET
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	171	270	175	204	178	154	132	112	30	356	333	279	304	313	322	323	298	247	236	231	198	215	62	206
2	196	32	237	148	174	278	143	137	207	270	354	50	9	310	264	350	347	344	336	329	16	133	145	178
3	192	201	175	197	168	202	195	206	209	205	203	217	211	247	326	277	220	8	5	261	142	166	195	137
4	151	168	189	145	239	175	180	130	192	198	62	141	231	267	239	198	178	187	174	168	182	191	150	143
5	138	135	137	149	165	164	188	162	194		251	202	209	219	239	296	347	153	145	120	30	139	162	220
6	196	163	172	168	185	161	165	162	214	224	239	334	338	303	251	265	267	249	279	276	297	264	258	257
7	263	264	224	239	213	140	124		360	350	323	345	354	354	10	15	130	95	317	553	331	253	278	187
8	271	277	171	185	304	314	71	73	327	345	337	317	336	332	303	208	242	25	82	124	145	265	310	327
9	160	103	149	138	138	248	9	51	317	312	292	220	109	345	329	314	229	131	174	163	189	133	113	191
10	142	94	126	131	281	226	142	90	14	1	315	341	345	306	303	293	296	296	302	210	249	115	108	236
11	182	130	190	220	8	46	195	74						183	210	202	216	229	220	210	200	208	60	127
12	159	108	184	204	168	183	184	187	170	189														
13											219	215	211	215	224	221	222	226	221	204	197	193	191	197
14	187	177	174	173	176	169	173				33	181	211	188	199	192	201	51	360	50	105	136	165	132
15	143	211	162	140	221	184	152	106	77	52														
16	201	201	222	334	355	254	214	221	307	321	330	316	310	307	304	305	318	341		23	101	128	256	60
17	282	350	122	222	246	62	113	111	58	102	216	212	214	223	224	225	219	221	216	215	212	205	217	205
18	203	214	198	195	169	142	150	202	198	212	220	214	224	227	221	227	230	233	225	216	214	208	274	324
19	309	306	310	343	335	283	265	307	360	9	353	326	247	230	225	231	230	221	232	212	192	191	193	196
20	192	183	179	181	205	190	161	134	278	307	302	265	273	269	265	269	254	265	260	211	186	192	192	185
21																								
22																								
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29																								
30																								
31																								
MEAN																								

TOTAL NUMBER OF OBSERVATIONS = 5120. MEAN = 217.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 8 FEET
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	16	12	8	13	9	11	7	12	18	20	27	19	27	17	13	15	10	12	8	10	8	10	5	8	14
2	11	9	6	6	10	7	11	16	23	28	27	17	27	17	10	15	11	13	5	7	3	7	9	9	12
3	13	21	6	16	5	13	15	13	14	11	13	14	29	21	9	28	17	18	3	10	13	11	12	9	14
4	6	11	8	13	9	5	4	14	30	22	18	36	24	14	19	11	17	13	10	7	7	9	10	7	13
5	9	8	7	7	11	8	8	11	19	22	23	13	22	13	13	27	12	15	8	13	5	12	9	5	13
6	10	10	12	12	10	7	8	22	16	14	14	7	10	13	14	14	15	12	8	10	10	8	8	9	12
7	8	6	6	7	8	9	7	7	30	24	15	15	13	15	10	14	20	20	14	4	5	6	9	7	11
8	13	8	7	7	11	13	10	17	21	31	19	19	15	17	18	13	12	14	15	9	9	8	11	19	14
9	9	7	11	8	5	5	9	16	21	13	12	14	24	31	22	14	18	11	11	13	14	13	10	12	13
10	8	7	7	15	10	9	10	24	18	31	26	21	24	21	25	17	15	12	8	12	8	18	11	10	15
11	9	9	10	7	16	15	12	12	13	12	12	13	12	13	13	13	11	11	9	8	9	16	13	11	12
12	8	12	19	9	8	8	12	8	13	17	14	13	15	14	13	5	10	10	12	10	11	13	10	13	11
13	10	16	11	11	9	15	10	16	13	13	15	12	13	15	12	11	13	12	12	8	6	9	9	7	12
14	9	9	9	9	10	9	10	8	21	25	33	20	18	18	23	15	11	10	9	8	11	9	8	12	10
15	10	19	8	11	12	8	8	14	21	25	33	20	18	18	23	15	11	15	7	7	5	9	5	11	14
16	7	6	9	6	8	9	11	21	11	18	28	27	17	17	14	18	12	12	5	9	5	4	6	8	12
17	11	6	8	7	6	16	13	18	16	27	14	15	15	17	15	14	13	11	9	6	9	13	9	19	13
18	16	14	19	10	10	15	9	19	11	12	15	14	14	12	13	14	13	11	12	9	8	16	12	12	13
19	5	7	10	9	5	7	9	24	21	26	17	23	29	13	15	12	12	11	7	7	6	9	8	8	12
20	10	11	9	10	9	10	10	16	18	21	19	18	18	16	16	15	14	13	9	9	8	10	9	10	10

TOTAL NUMBER OF OBSERVATIONS = 5373. MEAN = 13.

: INDICATES CALIBRATION DURING THE HOUR

JOURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 30 FEET TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	14	5	7	7	5	11	6	8	12	18	28	22	15	22	11	8	6	9	6	5	10	3	9	11
2	5	5	5	6	7	6	10	12	18	26	25	12	10	15	5	10	9	5	4	5	8	4	5	9
3	10	23	4	11	4	9	21	10	11	10	8	6	15	7	22	15	13	10	6	11	6	10	6	11
4	4	10	5	11	5	5	3	12	21	18	14	36	19	11	14	9	7	4	6	3	6	8	3	10
5	7	4	5	4	7	11	5	12	23		21	9	11	10	15	7	11	5	2	3	3	9	7	5
6	5	5	8	4	7	5	9	18	11	11	13	10	10	9	11	10	9	4	6	7	3	5	5	8
7	5	4	3	3	5	4	7		24	21	15	13	8	9	11	12	15	11	5	5	3	9	4	9
8	13	6	4	4	7	5	13	12	24	20	15	14	12	18	10	10	7	11	10	6	7	3	12	11
9	6	3	8	9	3	4	6	11	18	11	6	12	14	23	17	11	7	11	8	9	14	6	9	10
10	3	5	5	11	8	7	10	22	13	22	24	24	19	19			12	7	8	9	9	6	9	14
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25	4	17	8	5	6	11	8	11	11	15	9	10	12	18	5	8	7	9	6	7	8	8	11	9
26	5	5	4	6	6	2	4							10	8	9	8	8	3	3	7	6	6	9
27	8	15	5	10	6	6	4	9	19	25	27	20	14	16	10	14	16	4	4	5	5	5	7	12
28	2	8	6	8	4	5	7	15	13	15	23	23	20	12	14	17	11	10	2	8	1	9	7	8
29	7	6	2	5	8	21	14	16	13	22	10	11	13	12	13	10	12	6	4	5	8	14	12	11
30	8	8	13	9	12	12	7	19	5	10	11	11	11	8	10	9	7	9	6	7	6	8	8	9
31	5	5	9	6	7	1	5	22	16	16	14	18	20	11	11	9	8	8	4	3	3	4	4	7
MEAN	6	8	6	7	6	7	8	14	15	17	17	16	14	12	13	11	10	10	6	5	6	8	6	7

TOTAL NUMBER OF OBSERVATIONS = 4909. MEAN = 10.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 100 FEET
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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30																								
31																								
MEAN																								

TOTAL NUMBER OF OBSERVATIONS = 2072. MEAN = 8.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 200 FEET
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

HOUR

DAY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 MEAN

DAY

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 MEAN

25	10	7	7	4	12	5	5	11	17	17	17	14	11	12	9	7	4	6	1	10	8	4	8
12	11	9	6	9	9	3	9	15	25	25	25	12	9	10	4	8	9	4	4	4	3	4	
4	12	19	5	12	8	13	11	9	8	6	6	10	15	12	6	10	6	5	2	5	4	5	
1	4	5	9	3	4	2	12	19	22	13	13	33	20	9	9	4	4	3	2	4	11	4	
2	3	3	3	3	10	5	6	19	7	7	7	6	8	11	9	7	3	5	3	3	3	11	
9	6	11	9	9	18	19	21	8	7	7	7	6	9	9	14	4	7	6	7	6	3	3	
6	4	2	2	4	5	6	6	12	18	8	10	10	6	10	7	12	15	3	8	5	5	3	
14	7	3	8	14	7	2	11	16	16	8	8	11	9	13	15	9	9	5	10	17	7	4	
7	5	7	7	11	9	5	10	14	13	6	10	10	13	20	13	6	5	5	16	18	3	12	
15	7	4	8	5	6	10	17	26	27	16	16	10	13	12	10	6	6	4	5	12	5	6	
4	10	7	8	19	14	13	8	6	6	6	6	10	13	12	10	3	3	3	4	8	22	8	
9	25	19	7	1	4	5	4	6	6	9	9	8	8	6	6	7	4	3	3	4	8	8	
4	3	3	2	4	4	4	4	17	17	25	25	22	15	11	7	9	6	3	3	3	4	4	
4	14	2	4	12	7	2	10	17	10	15	15	13	10	9	12	4	3	6	6	6	4	4	
8	9	6	8	7	2	1	17	14	10	15	15	13	10	9	12	14	2	5	4	6	10	13	
7	8	5	11	4	12	6	12	14	18	8	8	9	11	7	10	8	7	1	2	13	19	8	
6	17	11	7	6	5	8	10	3	6	6	6	7	6	7	8	7	5	2	4	9	7	7	
5	4	7	7	7	7	5	22	25	13	12	12	19	22	8	10	6	5	1	1	2	4	2	
8	9	7	7	7	8	6	11	14	15	13	13	13	11	10	9	7	5	4	5	7	7	7	

TOTAL NUMBER OF OBSERVATIONS = 5108. MEAN = 9.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF TEMPERATURE AT 8 FEET (DEG F)
 TRAILER NO. - 23 PERIOD (8/1/77 TO 8/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	55	56	57	56	49	54	57	62	69	72	75	77	78	79	80	81	80	80	78	73	67	64	64	60	68
2	59	58	57	58	55	55	58	49	69	76	79	82	83	85	86	86	86	83	80	76	70	68	70	68	71
3	65	62	60	60	59	59	60	70	79	83	85	86	85	87	85	84	83	81	79	77	75	71	69	65	74
4	64	62	60	59	59	53	53	66	72	75	77	78	78	77	77	75	73	73	72	69	66	64	61	63	68
5	57	55	55	54	53	53	53	56	60	65	67	68	65	68	73	75	77	74	69	58	57	57	55	54	61
6	53	52	50	50	49	48	50	53	59	66	72	77	78	81	82	83	81	80	79	75	67	67	61	59	66
7	58	50	57	59	62	60	62	69	77	80	81	83	84	85	86	86	84	83	81	75	69	68	68	70	73
8	71	57	66	64	65	63	65	71	74	75	77	79	80	82	81	80	82	82	81	76	70	66	64	63	73
9	62	58	56	53	53	51	55	62	68	74	78	80	82	83	82	84	83	82	79	74	68	64	62	60	69
10	67	59	56	55	55	55	56		67	72	77	80	82	82	82	81	80	79	79	75	71	70	67	61	70
11	58	50	54	52	51	51	52	56	63	67	73	76	79	79	78	78	74	72	72	67	62	60	60	59	64
12	57	55	57	55	56	56	59	65	70	74	76	79	80	82	81	81	79	78	75	71	68	64	61	57	68
13	58	57	58	56	55	56	58	65	71	76	77	78	78	78	76	75	77	76	75	71	67	64	63	62	68
14	61	60	59	60	57	58	61	70	74	77	79	78	75	76	76	79	81	79	76	72	70	68	64	61	70
15	62	60	59	60	59	59	63	68	69	69	74	75	76	77	69	64	65	65	62	60	59	57	56	55	64
16	55	56	56	56	55	55	56	60	64	67	69	72	73	73	74	75	74	73	71	68	66	65	63	61	65
17	62	62	62	62	60	60	60	63	66	67	67	71	69	68	68	69	74	64	61	61	60	60	60	61	63
18	59	60	59	59	56	58	60	62	64	67	72	72	68	72	77	77		77	76	71	64	61	59	58	65
19	57	56	55	54	54	54	55	65	65	70	72	75	78	80	78	74	72	72	71	66	64	62	60	61	63
20	59	59	57	55	56	55	56	63	67	71	75	77	78	80	78	78	77	72	71	67	64	64	60	60	67
21	67	57	56	55	54	53	55	62	66	68	67	67	71	77	79	77	73	70	64	63	61	61	60	59	64
22	59	58	55	54	53	53	57	61							82	83	83	80	77	70	67	63	62	60	65
23	61	60	57	59	59	59	58	64	68	71	75	76	74	81	80	81	78	77	75	69	70	69	66	66	68
24	55	66	56	55	64	63	63	65	62						71	59	66	68	66	62	59	58	58	57	66
25		61	57	54	54	54	54	59	62						77	76	77	75	72	68	66	64	64	65	66
26	64	63	62	62	61	60	62								79	68	61	59	54	51	46	43	42	41	59
27	67	60	59	59	40	40	41	43	46	48	51	53	54	54	57	57	58	57	56	53	48	47	47	46	48
28	45	44	45	45	44	44	45	40	54	56	58	61	64	65	65	66	67	65	62	59	55	53	52	50	55
29	47	43	45	44	45	44	45	51	58	65	69	71	74	75	76	75	75	74	70	63	59	58	57	59	60
30	59	58	58	56	54	54	58	61	70	75	76	78	80	80	80	80	79	77	74	71	68	68	68	66	69
31	61	57	55	52	50	46	50	55	59	64	70	70	76	77	79	80	78	77	72	66	63	67	67	60	65
MEAN	58	57	56	56	55	55	56	61	68	70	73	75	76	77	77	76	76	76	75	72	68	64	63	61	70

TOTAL NUMBER OF OBSERVATIONS = 8469. MEAN = 66.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF TEMPERATURE AT 37 FEET (DEG F)
TRAILER NO. - 23 PERIOD 8/ 1/77 TO 8/31/77)

DAY	HOUR																								24 MEAN
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	59	60	60	63	64	63	63	69	78	75	78	80	81	82	83	84	84	82	80	78	74	73	72	71	
2	65	64	63	62	63	61	60	66	71	82	83	84	84	85	84	83	82	82	79	78	76	72	70	67	
3	56	56	55	54	54	53	53	56	60	62	66	67	64	66	72	74	72	72	72	71	67	64	62	60	
4	50	53	52	51	51	51	51	53	59	65	71	75	76	80	81	81	81	80	79	76	73	71	63	55	
5	50	60	60	62	65	64	64	69	76	78	79	81	82	83	84	84	83	82	81	77	72	70	62	62	
6	73	68	67	65	67	66	66	71	73	74	75	78	80	80	79	79	81	81	81	77	73	70	71	71	
7	65	64	60	67	69	66	66	62	67	72	76	78	80	81	81	82	81	81	79	77	74	67	66	66	
8	63	62	61	59	67	67	66	61	67	71	75	78	80	80	80	79	80	79	78	76	73	68	66	66	
9	60	59	58	56	54	53	53	55	62	66	71	75	77	78	78	78	73	71	72	69	66	63	62	62	
10	60	61	61	61	60	59	59	64	70	73	75	77	79	80	79	79	79	77	75	72	68	65	65	64	
11	60	62	62	63	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	66	
12	60	62	62	62	61	61	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	64	
13	60	62	62	62	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	64	
14	60	62	62	62	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	66	
15	60	62	62	62	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	64	
16	60	62	62	62	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	66	
17	60	62	62	62	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	62	
18	60	62	62	62	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	59	
19	60	62	62	62	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	56	
20	60	62	62	62	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	60	
21	60	62	62	62	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	57	
22	60	62	62	62	63	60	63	69	74	76	77	77	74	75	76	78	79	79	77	73	71	69	65	5	
23																									
24																									
25																									
26																									
27																									
28																									
29																									
30																									
31																									
MEAN	59	60	60	63	64	63	63	69	78	75	78	80	81	82	83	84	84	82	80	78	74	73	72	71	

TOTAL NUMBER OF OBSERVATIONS :

TOTAL NUMBER OF OBSERVATIONS =

: INDICATES CALIBRATION DURING THE HOUR

JOURNAL VARIATION OF TEMPERATURE AT 200 FEET (DEG F)
TRAILER NO. - 23 PERIOD (8/1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	70	68	68	67	66	67	66	69	66	73	75	77	79	79	80	81	82	82	82	79	78	76	75	74
2	68	66	65	63	64	63	64	65	76	79	81	82	82	83	82	81	81	79	78	77	75	71	70	74
3	65	65	65	63	64	63	64	65	69	71	73	74	74	74	73	72	69	70	70	69	68	63	61	59
4	65	65	65	64	64	63	63	64	68	60	63	65	63	66	69	72	74	72	69	61	63	62	58	56
5	65	65	65	64	64	63	62	62	67	63	69	73	74	77	79	79	79	79	78	76	74	73	66	62
6	62	61	62	65	69	68	67	70	74	76	77	78	81	81	82	82	81	81	79	77	75	74	73	72
7	73	68	69	67	67	65	66	69	71	72	73	75	76	77	77	77	79	79	79	77	74	73	68	67
8	65	65	65	62	60	59	58	61	65	70	73	75	77	78	78	79	79	77	77	76	74	72	70	67
9	64	65	64	62	60	59	59	60	64	68	72	75	77	77	77	77	78	77	77	76	74	71	68	67
10	63	61	60	60	60	56	54	53	60	64	69	72	74	75	75	75	72	70	70	70	69	67	65	65
11	63	62	64	63	62	60	61	63	67	71	72	74	75	77	77	77	77	75	73	70	68	67	66	67
12	65	64	64	64	63	61	62	64	68	72	73	73	73	74	73	72	73	73	73	72	71	70	69	69
13	65	65	64	63	64	63	64	67	71	73	74	74	71	72	74	76	77	77	75	71	69	69	67	70
14	67	64	63	66	62	64	64	65	66	66	68	70	72	73	66	62	63	63	61	61	60	59	59	56
15	58	56	59	56	56	57	58	58	62	64	65	68	70	69	70	71	71	71	70	68	68	66	64	64
16	63	64	65	64	64	62	62	64	64	64	68	68	65	65	65	65	65	63	60	60	59	59	61	60
17	67	61	63	60	59	59	60	60	62	64	68	68	64	64	74	74	65	63	60	60	59	58	57	57
18	65	65	65	65	65	65	65	65	65	64	64	64	64	64	74	74	65	63	60	60	59	58	57	57
19	65	65	65	65	65	65	65	65	65	64	64	64	64	64	74	74	65	63	60	60	59	58	57	57
20	65	65	65	65	65	65	65	65	65	64	64	64	64	64	74	74	65	63	60	60	59	58	57	57
21	65	65	65	65	65	65	65	65	65	64	64	64	64	64	74	74	65	63	60	60	59	58	57	57
22	64	62	63	63	62	62	62	62	63	66	68	69	68	66	74	75	78	77	76	74	59	66	64	62
23	65	65	65	64	62	62	62	62	63	66	68	69	68	66	74	75	78	77	76	74	69	66	66	66
24	65	65	65	64	62	62	62	62	63	66	68	69	68	66	74	75	78	77	76	74	69	66	66	66
25	65	65	65	64	63	63	62	62	63	66	68	69	68	66	74	75	78	77	76	74	69	66	66	66
26	65	65	64	63	63	63	62	62	63	66	68	69	68	66	74	75	78	77	76	74	69	66	66	66
27	65	65	64	63	63	63	62	62	63	66	68	69	68	66	74	75	78	77	76	74	69	66	66	66
28	65	65	64	63	63	63	62	62	63	66	68	69	68	66	74	75	78	77	76	74	69	66	66	66
29	65	65	64	63	63	63	62	62	63	66	68	69	68	66	74	75	78	77	76	74	69	66	66	66
30	65	65	64	63	63	63	62	62	63	66	68	69	68	66	74	75	78	77	76	74	69	66	66	66
31	65	65	64	63	63	63	62	62	63	66	68	69	68	66	74	75	78	77	76	74	69	66	66	66
MEAN	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61

TOTAL NUMBER OF OBSERVATIONS = 7215. MEAN = 66.

: INDICATES CALIBRATION DURING THE HOUR

HOURLY TOTAL SOLAR RADIATION (LANGLEY)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1	0	0	0	0	0	2	11	27	47	62	74	81	83	80	71	58	43	26	9	0	0	0	0	0	674
2	0	0	0	0	0	2	15	27	45	60	73	79	83	80	69	54	40	18	4	0	0	0	0	0	649
3	0	0	0	0	0	2	15	31	47	57	54	56	35	53	22	26	26	10	4	0	0	0	0	0	438
4	0	0	0	0	0	2	7	31	25	40	65	47	40	25	36	17	35	23	7	0	0	0	0	0	400
5	0	0	0	0	0	0	7	23	44	50	61	44	36	32	56	42	39	15	1	0	0	0	0	0	450
6	0	0	0	0	0	1	8	27	42	59	67	58	55	46	54	39	29	12	5	0	0	0	0	0	502
7	0	0	0	0	0	1	11	28	41	60	71	77	80	77	71	59	40	26	7	0	0	0	0	0	649
8	0	0	0	0	0	1	6	28	29	32	42	68	80	53	50	23	31	23	11	0	0	0	0	0	477
9	0	0	0	0	0	1	12	28	45	59	71	78	72	62	42	56	39	24	7	0	0	0	0	0	596
10	0	0	0	0	0	1	11	10	44	58	70	77	77	56	48	26	17	10	6	0	0	0	0	0	511
11	0	0	0	0	0	1	11	24	37	25	50	70	77	51	22	16	4	12	6	0	0	0	0	0	406
12	0	0	0	0	0	1	12	28	44	40	58	77	58	63	38	21	13	8	4	0	0	0	0	0	465
13	0	0	0	0	0	1	12	26	43	58	50	26	55	22	10	14	29	20	6	0	0	0	0	0	372
14	0	0	0	0	0	0	11	27	40	58	50	19	22	28	31	34	41	16	2	0	0	0	0	0	379
15	0	0	0	0	0	1	8	13	28	32	65	59	67	46	13	10	6	3	0	0	0	0	0	0	351
16	0	0	0	0	0	0	7	23	36	38	43	73	45	29	59	53	32	10	3	0	0	0	0	0	451
17	0	0	0	0	0	0	5	14	9	13	20	15	17	17	24	21	13	3	1	0	0	0	0	0	172
18	0	0	0	0	0	0	6	8	13	39	73	30	32	47	64	41	20	20	2	0	0	0	0	0	395
19	0	0	0	0	0	0	8		36	47	23	78	84	69	36	31	20	17	5	0	0	0	0	0	454
20	0	0	0	0	0	1	10	27	42	57	68	77	57	55	21	18	12	9	4	0	0	0	0	0	458
21	0	0	0	0	0	1	10	24	24	20	15	17	60	71	42	20	14	8	3	0	0	0	0	0	329
22	0	0	0	0	0	0	10	26	38	56	68	75	63	48	34	53	36	15	3	0	0	0	0	0	525
23	0	0	0	0	0	1	10	27					7	75	53	39	9	8	2	0	0	0	0	0	231
24	0	0	0	0	0	0	1	4	17	32	42	57	28	34	17	8	34	7	2	0	0	0	0	0	283
25	0	0	0	0	0	0	4	14	35	52	56	76	81	72	62	41	37	15	3	0	0	0	0	0	548
26	0	0	0	0	0	0	10	1						72	66	26	17	6	1	0	0	0	0	0	199
27	0	0	0	0	0	0	5	12	36	34	46	60	47	63	58	32	22	4	2	0	0	0	0	0	421
28	0	0	0	0	0	0	4	17	30	48	63	69	78	77	50	41	39	19	3	0	0	0	0	0	538
29	0	0	0	0	0	0	6	25	40	55	67	74	76	72	59	49	33	17	3	0	0	0	0	0	578
30	0	0	0	0	0	0	6	11	32	59	67	75	77	73	64	50	35	14	1	0	0	0	0	0	564
31	0	0	0	0	0	0	7	25	40	55	66	74	36	41	60	51	34	14	2	0	0	0	0	0	505
TOTAL/10	0	0	0	0	0	2	26	63	102	135	163	176	170	168	140	106	85	43	11	0	0	0	0	0	0

TOTAL NUMBER OF OBSERVATIONS = 8694. TOTAL = 13970.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF RELATIVE HUMIDITY AT 8 FEET
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	23	25	28	28	28	29	30	23	18	14	13	12	10	11	11	10	10	12	14	16	18	21	20	21
2	35	37	38	41	41	41	42	26	18	15	13	12	12	12	13	15	17	18	18	20	23	27	29	33
3	74	79	82	81	85	88	87	36	30	27	24	23	23	25	26	28	31	30	30	33	36	46	53	58
4	89	92	92	91	89	90	88	81	67	61	55	52	64	57	43	36	31	34	44	65	68	71	80	86
5	47	47	48	44	35	35	35	31	20	17	17	16	15	22	19	18	16	16	17	20	27	31	37	44
6	26	31	36	41	41	43	42	38	34	33	27	24	23	23	22	22	19	16	15	15	17	19	20	21
7	23	27	30	34	33	35	33	27	24	19	17	15	13	12	13	12	12	12	12	14	16	19	22	24
8	24	25	28	29	30	29	30	43	21	20	17	15	13	12	13	14	13	13	14	16	18	21	25	29
9	33	38	42	45	48	49	47	43	38	33	26	21	19	18	19	19	25	27	26	27	31	33	34	35
10	37	39	39	38	38	40	43	40	33	29	27	24	20	16	17	16	16	21	24	26	29	31	33	36
11	38	37	37	40	41	41	39	36	29	24	22	23	22	20	22	24	23	22	21	25	28	32	34	36
12	35	36	38	37	39	38	37	30	26	23	22	23	27	28	28	24	22	22	25	33	37	37	41	44
13	44	47	54	50	52	53	50	45	44	45	39	35	31	31	46	56	50	55	68	74	83	92	93	98
14	93	92	93	93	97	96	91	81	65	56	53	44	40	45	43	39	40	44	51	51	55	57	63	64
15	65	65	66	66	69	72	70	63	57	73	47	52	56	57	55	55	61	69	85	84	88	91	89	84
16	85	85	85	86	89	88	89	86	79	73	58	56	64	58	37	44	49	36	35	46	69	77	80	82
17	83	85	88	91	93	90	90	66	66	57	41	41	37	33	44	47	49	48	45	51	58	63	65	68
18	69	67	72	76	77	78	75	63	53	44	39	38	37	33	34	38	36	37	37	41	45	47	51	52
19	53	58	59	58	59	60	57	49	42	40	46	48	43	33	31	32	39	45	59	63	64	64	65	64
20	67	67	70	73	73	75	67	60	49	23	29	29	27	26	21	19	17	18	20	28	39	57	56	61
21	57	61	60	55	54	54	56	51	46	42	38	37	42	26	25	24	26	27	29	35	37	41	44	43
22	44	44	44	45	49	50	49	49	46	50	46	47	41	52	46	82	68	57	60	67	77	82	80	85
23	100	90	86	98	99	97	97	96	87	50	46	47	41	36	31	32	27	25	29	55	38	38	43	43
24	43	46	48	48	49	49	44	99	92	79	66	62	58	64	52	54	49	51	54	59	84	100	99	100
25	100	98	98	99	99	100	99	99	99	79	66	62	58	64	52	54	49	51	54	61	72	76	75	79
26	80	82	76	78	79	81	80	72	54	50	46	42	36	33	32	31	30	30	34	38	43	47	52	52
27	56	69	64	66	63	63	65	56	49	39	31	30	27	24	22	23	25	26	28	34	37	39	40	39
28	38	41	40	46	51	43	44	43	30	25	25	24	21	20	20	19	19	20	22	25	27	28	28	30
29	40	46	50	54	57	59	57	46	43	38	32	28	25	24	20	18	17	18	22	29	34	32	30	32
30	55	57	58	60	61	61	60	54	46	38	34	32	31	29	28	29	29	30	33	38	44	48	50	52
MEAN	55	57	58	60	61	61	60	54	46	38	34	32	31	29	28	29	29	30	33	38	44	48	50	52

TOTAL NUMBER OF OBSERVATIONS = 8237. MEAN = 45.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF BAROMETRIC PRESSURE
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	797	797	798	798	798	798	798	798	799	799	798	798	798	797	797	796	796	796	796	796	796	797	797	797	797
2	797	797	797	797	797	797	797	797	798	798	797	797	796	796	795	795	794	794	794	794	794	794	794	794	794
3	794	794	794	794	794	794	794	793	793	793	793	793	792	792	792	792	792	792	792	792	792	793	793	793	793
4	793	793	793	793	793	793	793	793	793	794	793	793	793	793	793	793	793	793	792	792	792	793	793	793	794
5	794	794	794	793	793	793	794	794	794	794	794	793	793	793	793	792	792	792	791	792	792	792	792	793	793
6	792	793	793	793	793	794	794	794	794	794	794	793	793	793	792	792	792	791	791	792	792	792	792	793	792
7	792	792	792	792	793	793	793	793	794	794	794	793	793	793	792	792	792	792	792	792	792	792	792	792	792
8	792	792	792	793	793	793	793	793	794	794	793	793	792	792	792	791	791	790	790	791	791	792	793	793	793
9	793	793	793	793	793	793	794	794	795	795	794	794	794	793	793	793	792	792	792	792	792	793	793	793	793
10	793	793	793	793	793	793	794	794	794	794	794	793	793	793	793	792	792	792	792	792	792	793	793	793	794
11	794	794	794	794	794	794	795	796	796	796	796	796	795	794	794	794	794	795	795	795	795	795	795	795	795
12	795	795	795	795	795	795	796	796	796	795	795	794	794	793	793	792	792	792	792	792	793	793	793	793	793
13	793	793	793	793	793	793	793	793	793	793	793	792	792	791	791	791	791	791	791	791	791	792	792	791	792
14	791	791	791	791	792	792	792	792	793	792	792	792	792	791	791	791	790	790	790	791	792	793	792	791	792
15	793	792	792	792	793	793	793	794	794	794	794	794	793	793	793	794	794	794	795	795	795	796	796	796	796
16	795	795	795	795	795	796	796	796	796	797	797	797	796	796	796	795	795	795	795	796	796	796	796	797	797
17	797	797	796	796	796	797	797	797	797	797	798	797	797	797	798	797	797	797	796	797	797	797	797	797	797
18	797	797	797	796	796	796	796	796	797	796	796	796	795	795	795	794	794	794	794	794	795	795	795	795	795
19	795	795	795	795	795	795	796	796	796	796	796	796	795	795	795	795	795	795	795	795	795	795	796	796	796
20	796	796	795	795	795	795	796	796	796	796	796	795	795	794	794	794	794	794	794	794	795	795	795	795	795
21	794	794	794	794	794	794	794	795	795	795	795	795	794	793	792	792	792	792	793	793	793	793	793	793	793
22	794	793	794	793	793	793	794	794	794	794	794	793	793	792	791	791	791	791	791	791	791	792	792	792	792
23	792	792	792	792	792	792	793	793	793	793	792	792	792	793	792	792	792	792	792	792	792	793	793	793	793
24	793	793	793	793	793	793	793	793	793	793	792	792	792	791	791	791	791	791	790	790	791	791	791	791	791
25	791	791	791	792	791	791	791	791	792	791	791	790	790	789	789	788	788	788	788	788	788	788	787	787	787
26	787	786	786	786	786	786	786	786	786	786	786	786	784	783	784	784	784	785	786	787	787	787	788	788	788
27	788	789	788	788	788	788	789	789	790	790	790	790	790	790	790	790	790	790	790	790	791	791	792	792	792
28	792	792	792	792	792	793	794	795	795	795	796	796	795	795	795	795	795	795	795	795	796	796	796	796	796
29	796	796	796	796	796	796	796	796	796	796	795	795	794	794	793	793	792	792	792	792	793	793	793	792	792
30	792	792	792	792	792	791	791	791	790	790	790	790	789	789	788	788	788	787	788	788	788	788	789	789	789
31	789	790	791	791	792	792	792	792	792	792	792	792	791	791	791	790	790	790	790	790	790	790	790	790	790
MEAN	793	793	793	793	793	793	793	794	794	794	794	794	793	792	792	792	792	792	792	792	792	793	793	793	793

TOTAL NUMBER OF OBSERVATIONS = 8654. MEAN = 793.

: INDICATES CALIBRATION DURING THE HOUR

PRADIAN CORPORATION

DAILY VARIATION OF HORIZONTAL WIND DIRECTION STANDARD DEVIATION AT 30 FEET
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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MEAN	6	16	5	6	4	10	7	10	9	0	0	0	0	0	0	6	5	8	8	7	9	8	7	9

TOTAL NUMBER OF OBSERVATIONS = 215. MEAN = 8.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF VERTICAL WIND DIRECTION STANDARD DEVIATION AT 30 FEET
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1																									
2																									
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31																									
MEAN																									

TOTAL NUMBER OF OBSERVATIONS = 215, MEAN = 5.

: INDICATES CALIBRATION DURING THE HOUR

TEMPERATURE CHANGE FROM 30' TO 200' (DEG F*10)
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

[illegible]

TOTAL NUMBER OF OBSERVATIONS = 2046. MEAN = 3.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF BI-VANE WIND SPEED AT 100 FEET
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

DAY	HOUR																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																								
2																								
3																								
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25																								
26																								
27																								
28																								
29																								
30																								
31																								
MEAN	9	7	7	7	7	5	7	6	2	7	10	11	13	16	18	18	16	15	13	13	11	10	10	6

TOTAL NUMBER OF OBSERVATIONS = 1642. MEAN = 11.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF HORIZONTAL BI-VANE WIND DIRECTION AT 30 FEET
TRAILER NO. - 23 PERIOD(8/ 1/77 TO 8/31/77)

HOUR

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 MEAN

DAY

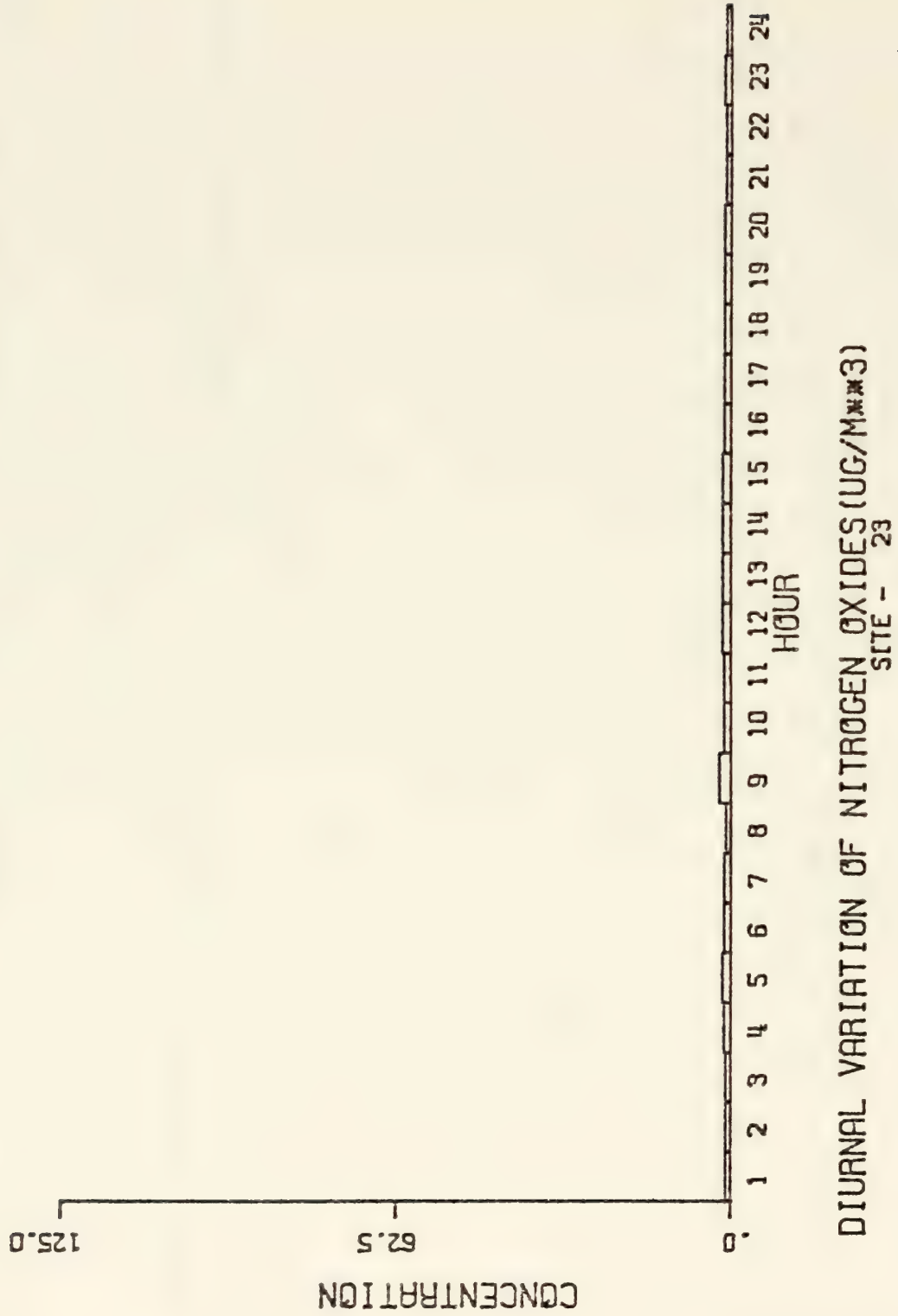
1
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30
31

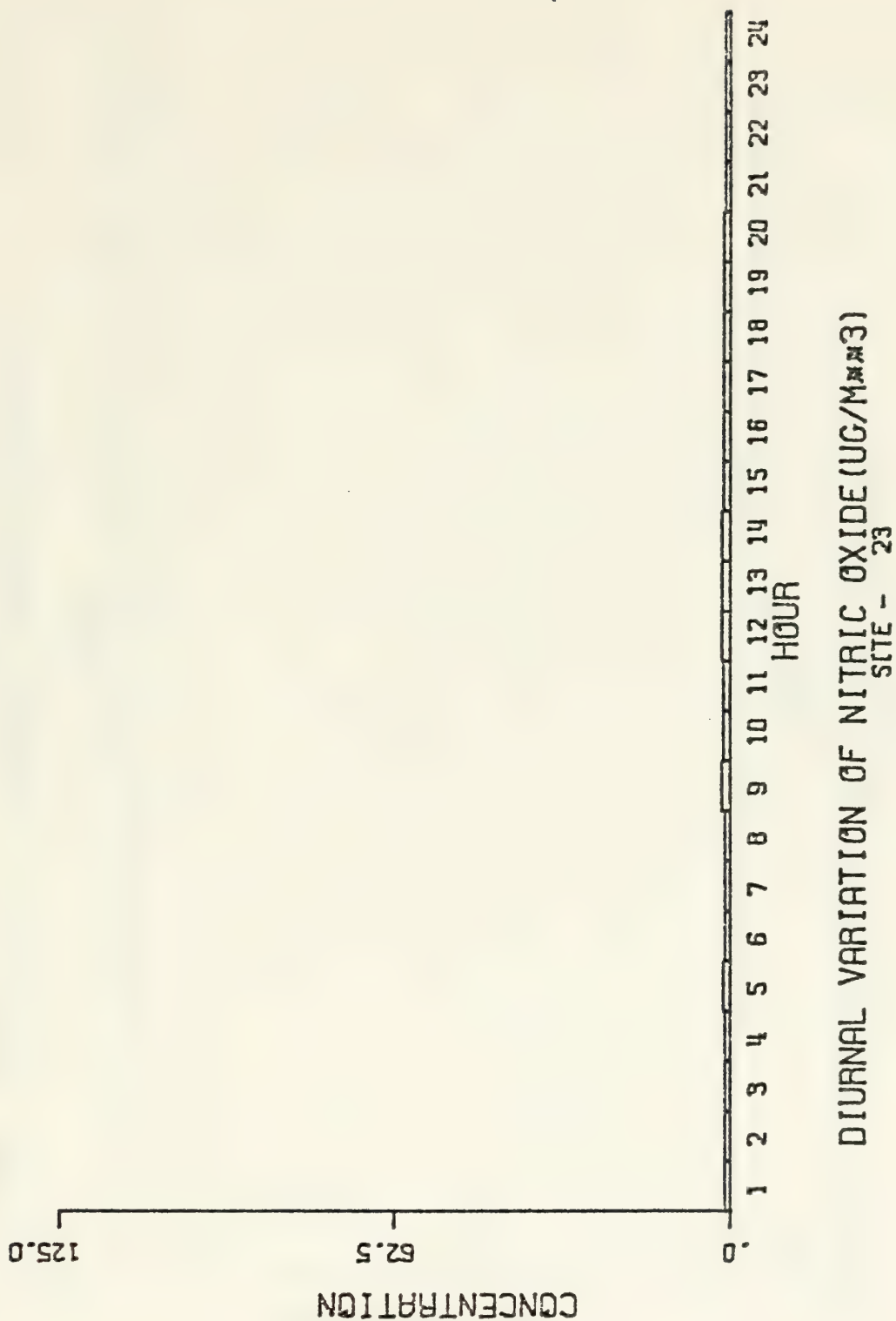
176 116 320 163 123 198 79 184 103 206 210 224 196 174 105 102 100 206 169 162

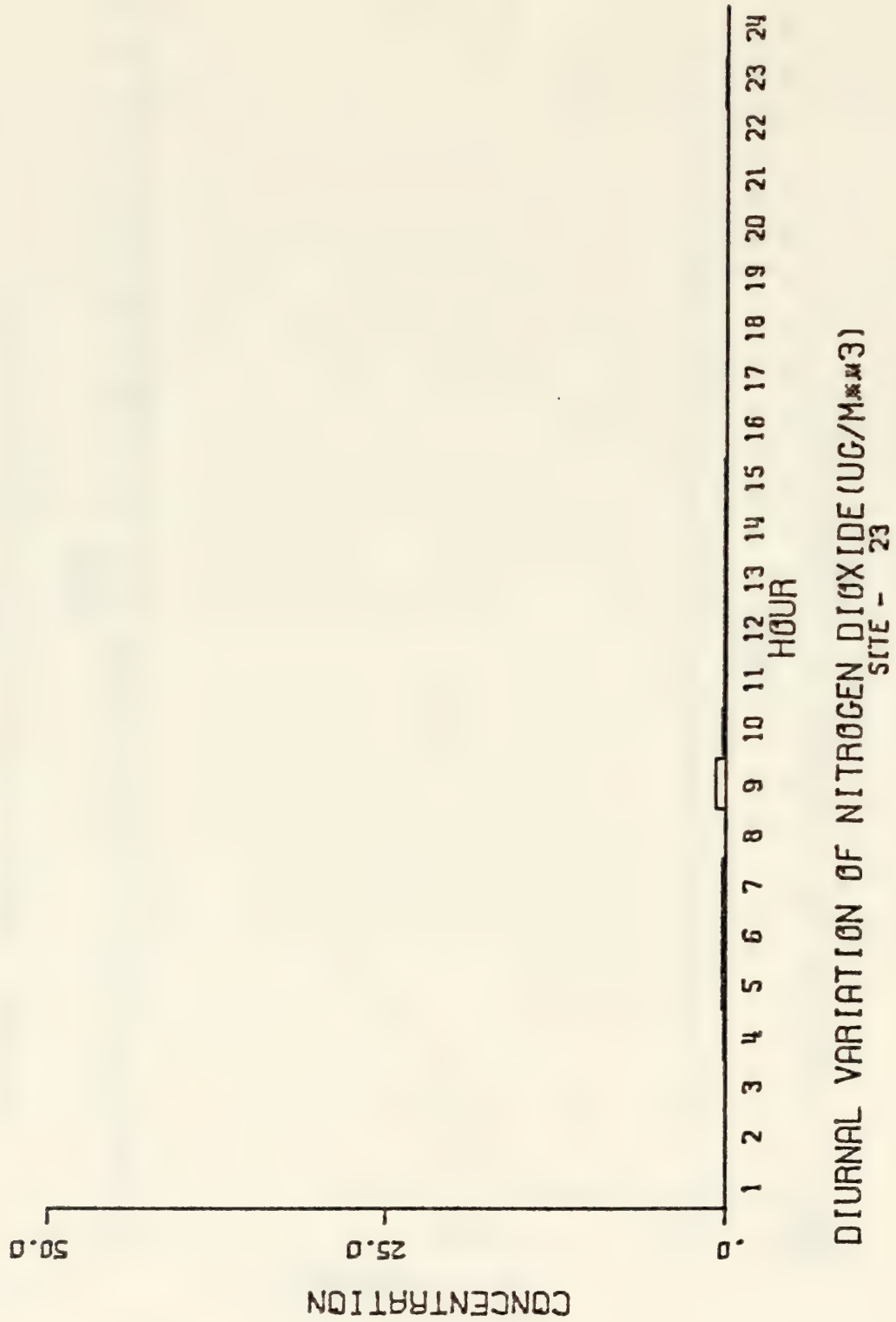
176 116 320 163 123 198 79 184 103 0 0 0 0 0 0 206 210 224 196 174 105 102 100 206

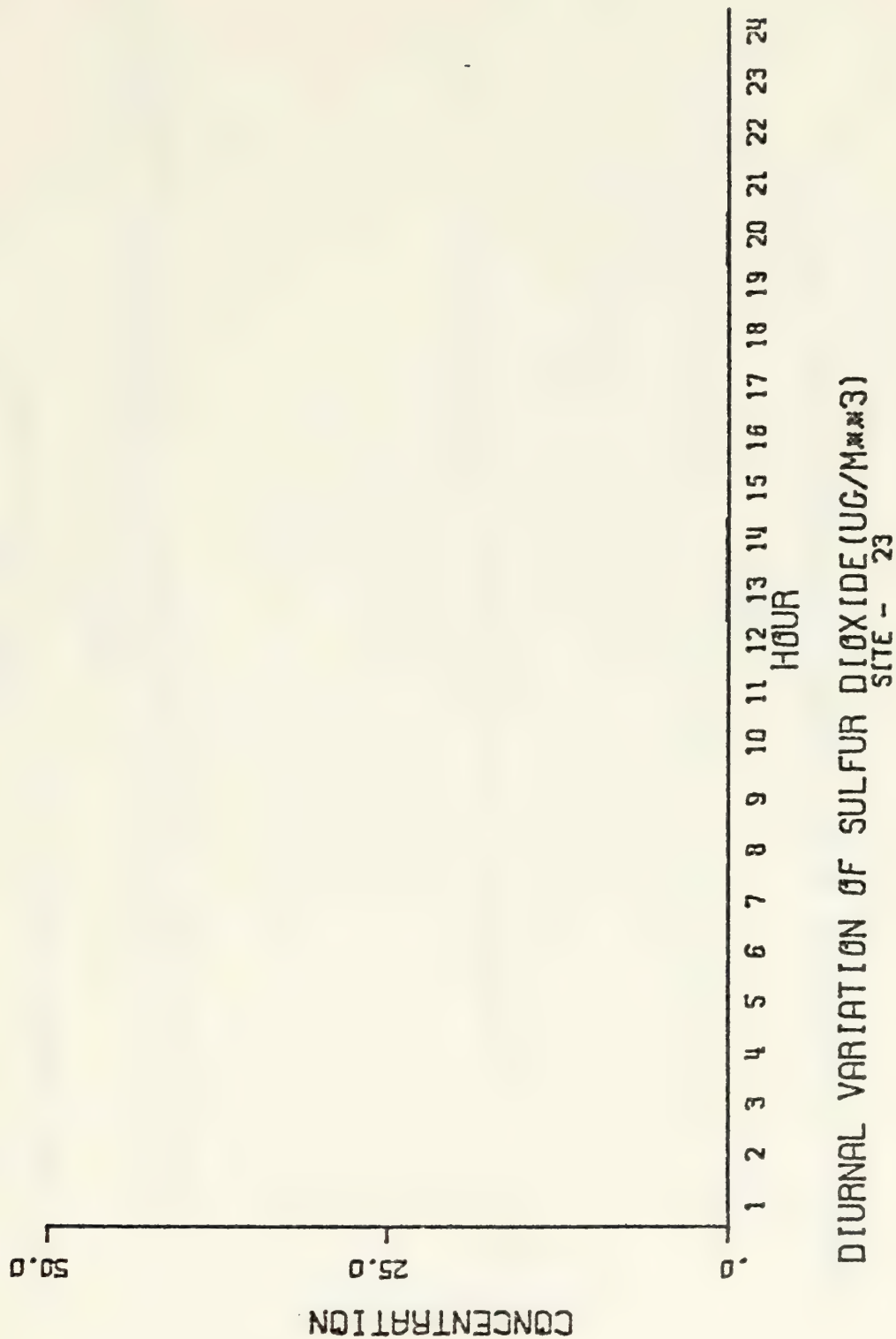
TOTAL NUMBER OF OBSERVATIONS = 215. MEAN = 166.

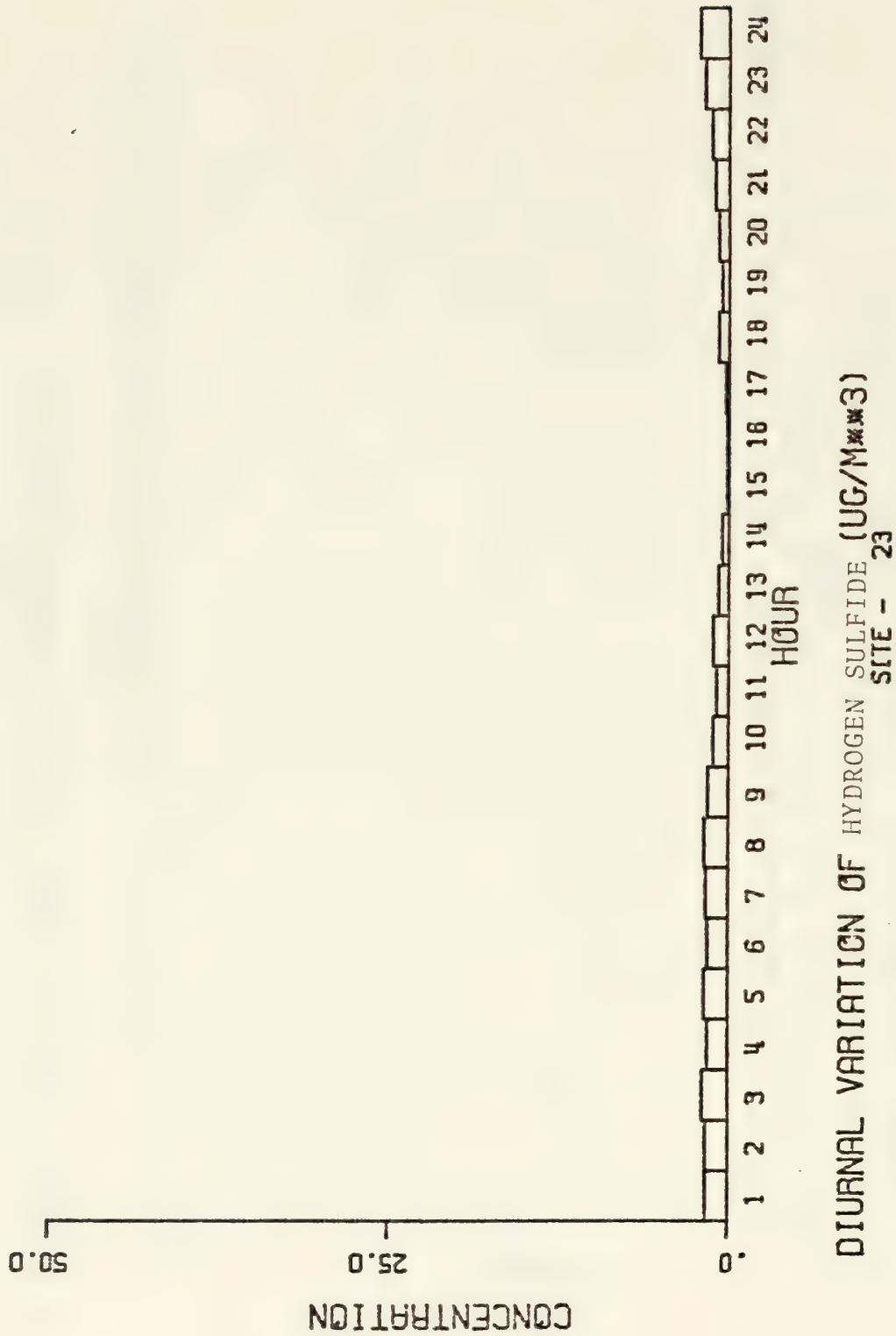
: INDICATES CALIBRATION DURING THE HOUR

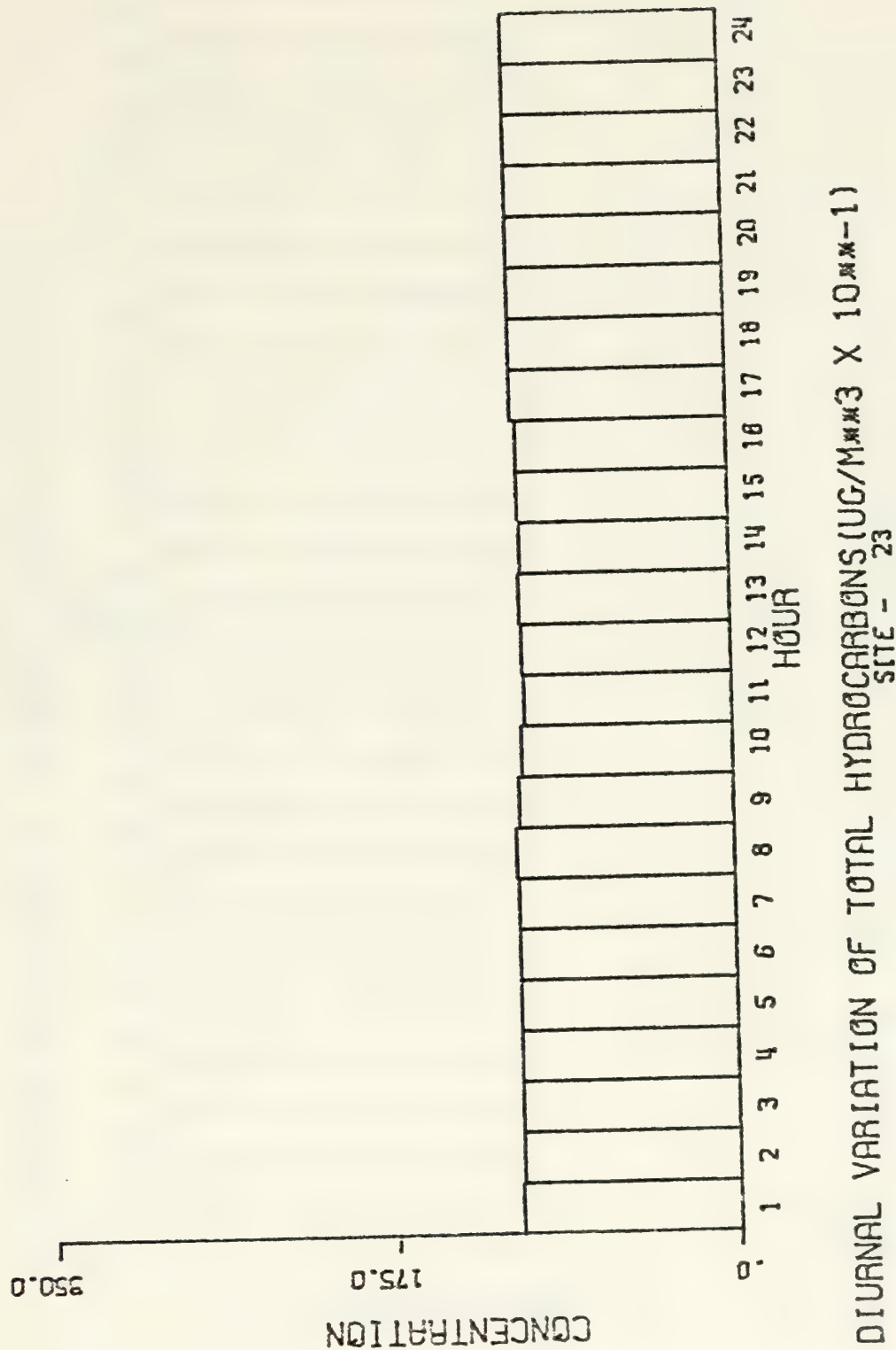


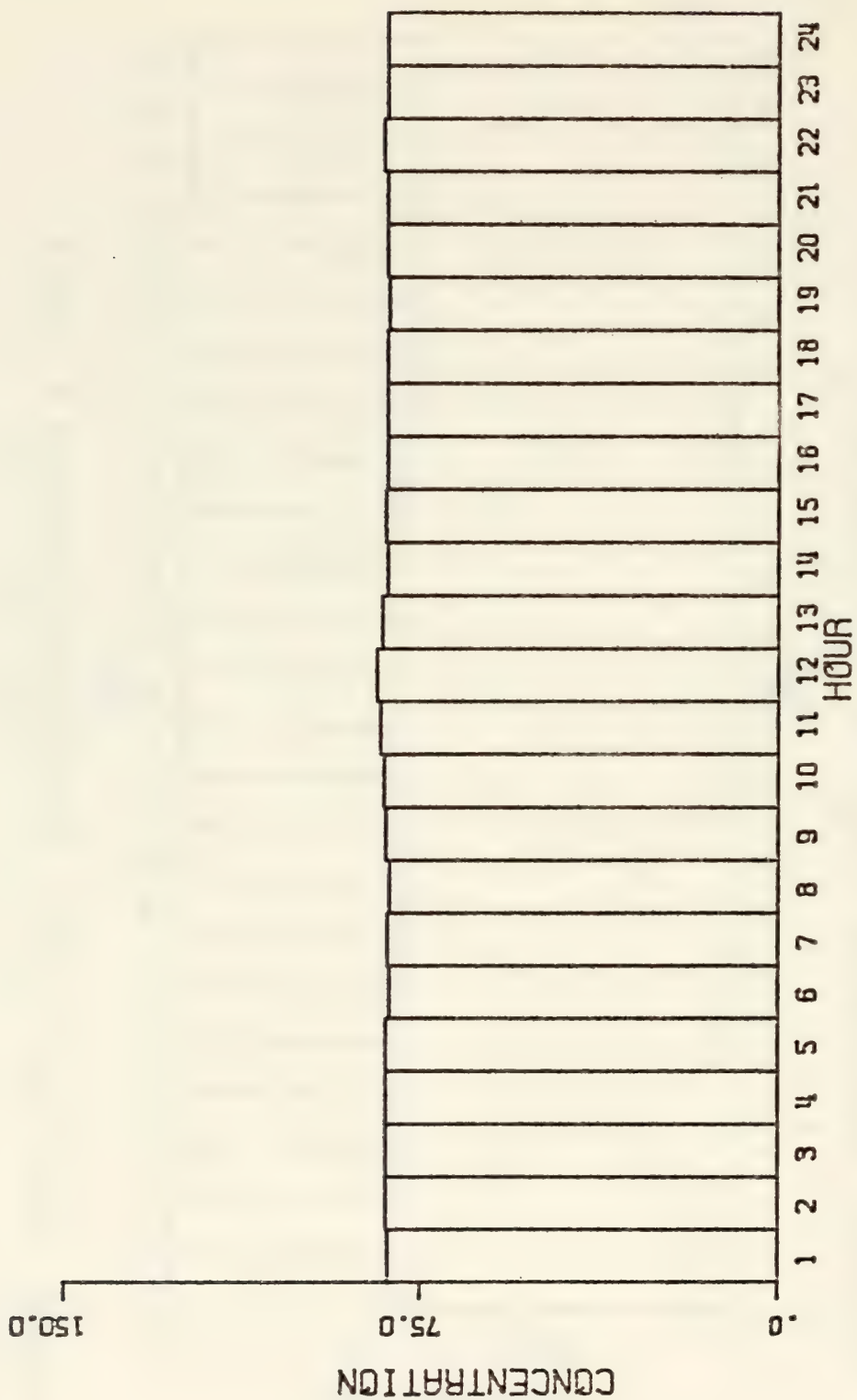




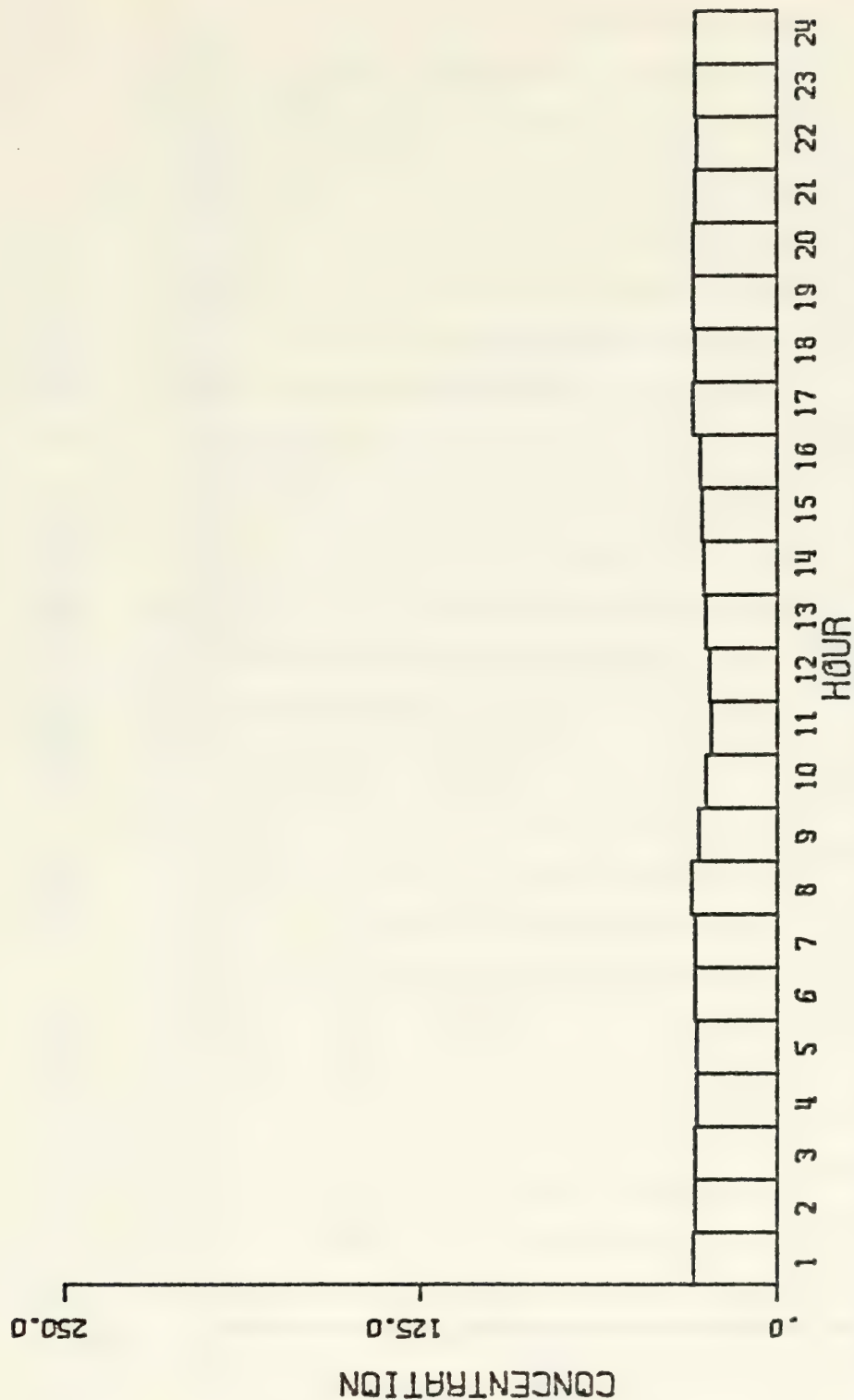




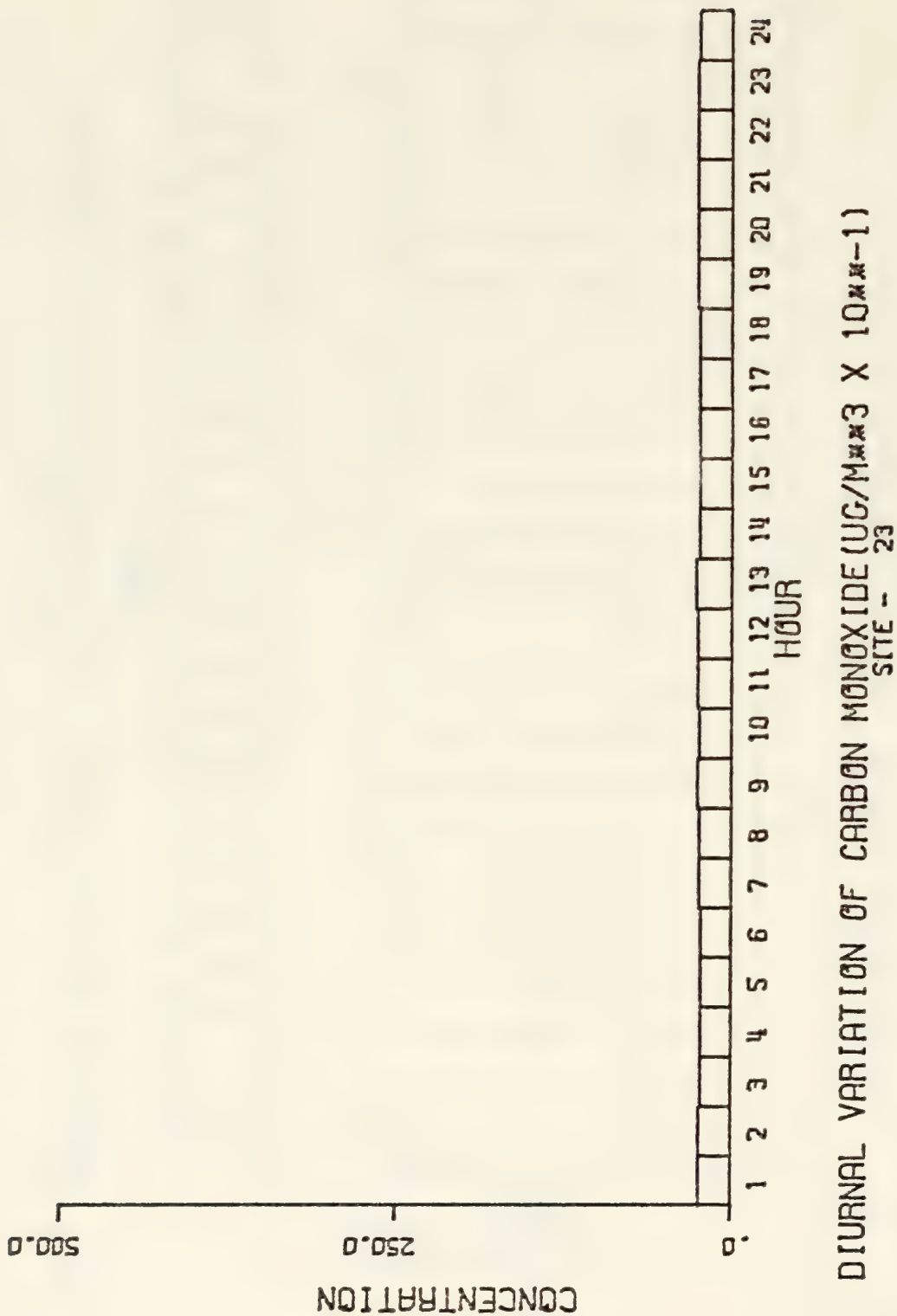


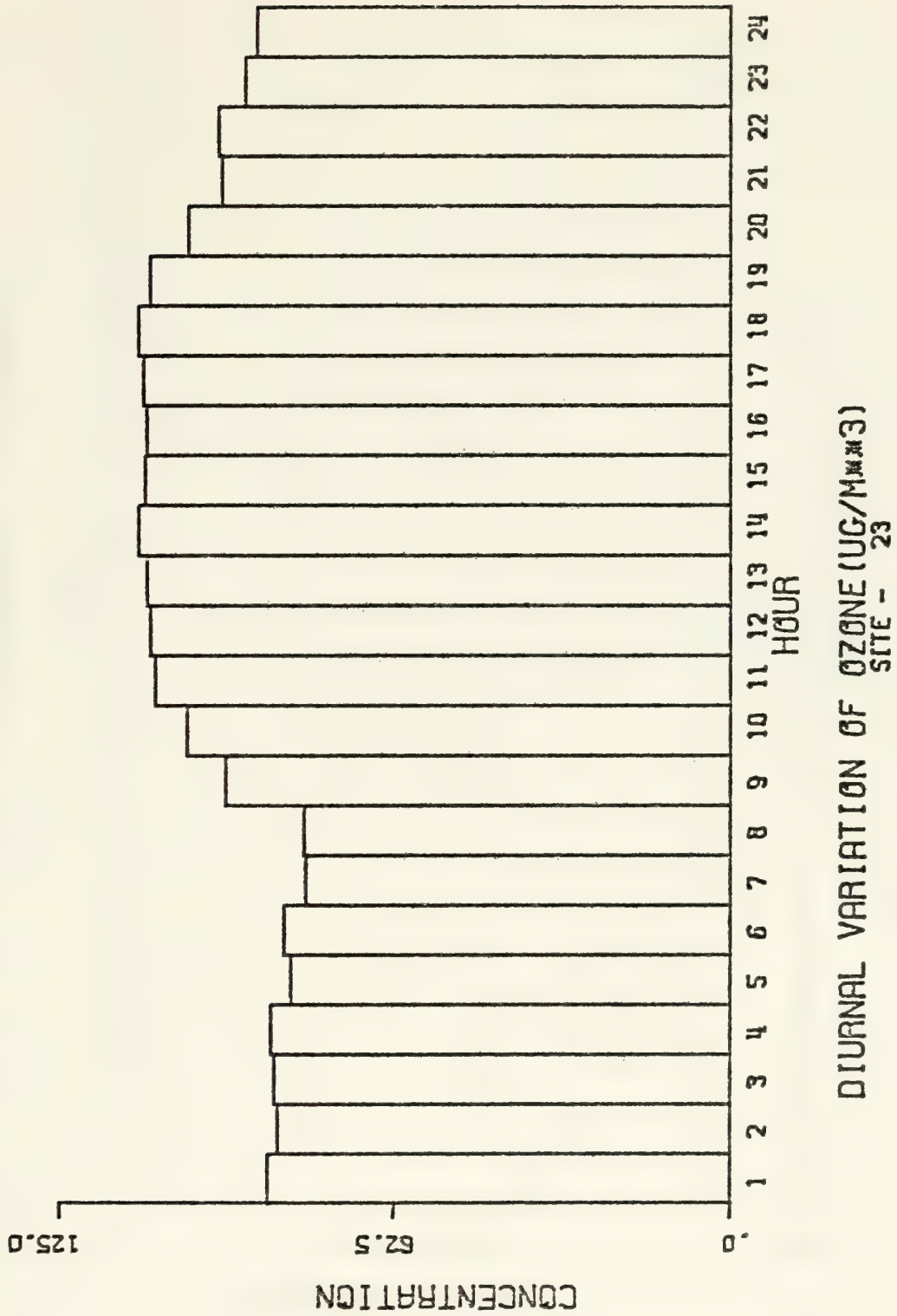


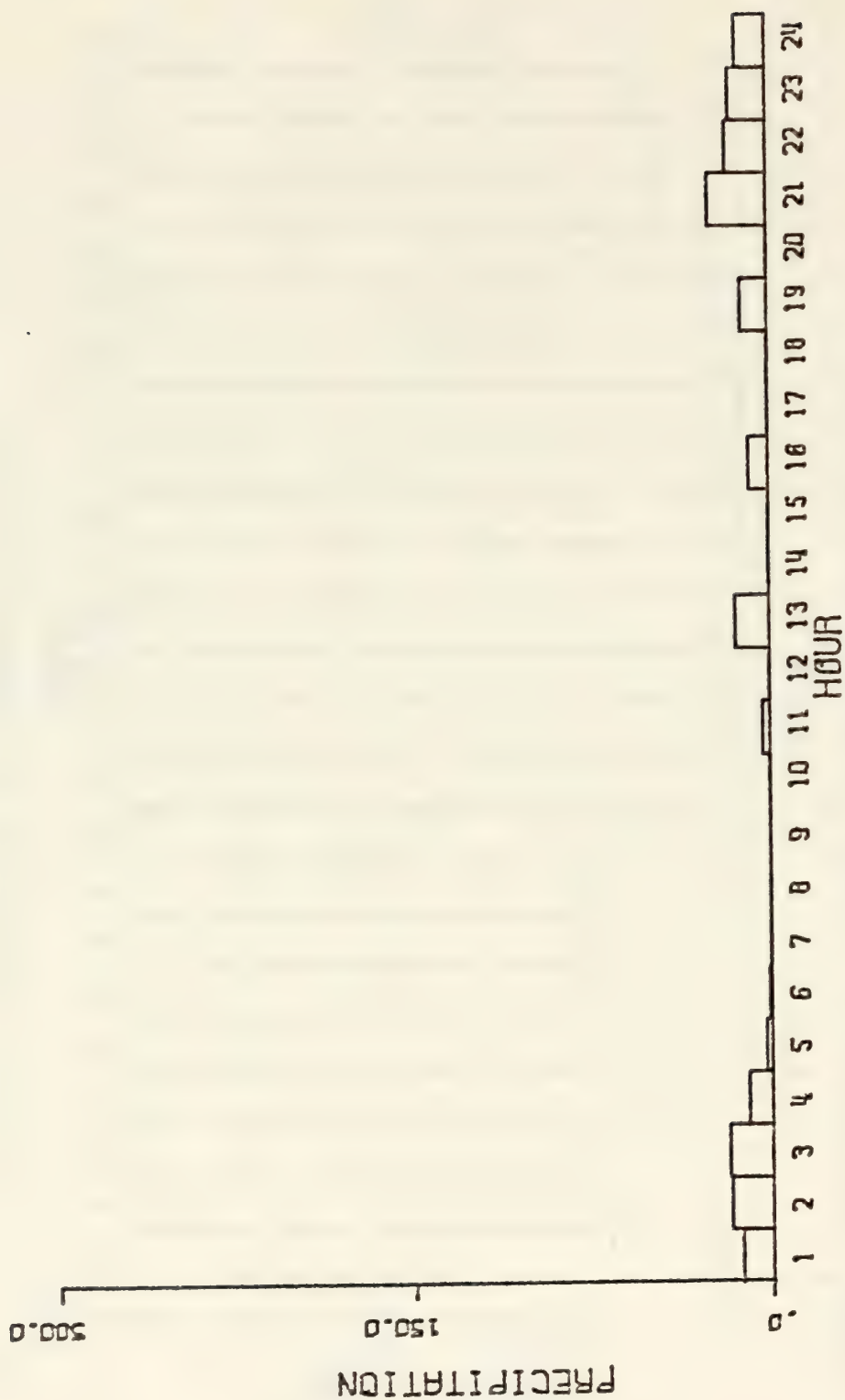
DIURNAL VARIATION OF METHANE (UG/M³ X 10³-1)
SITE - 23



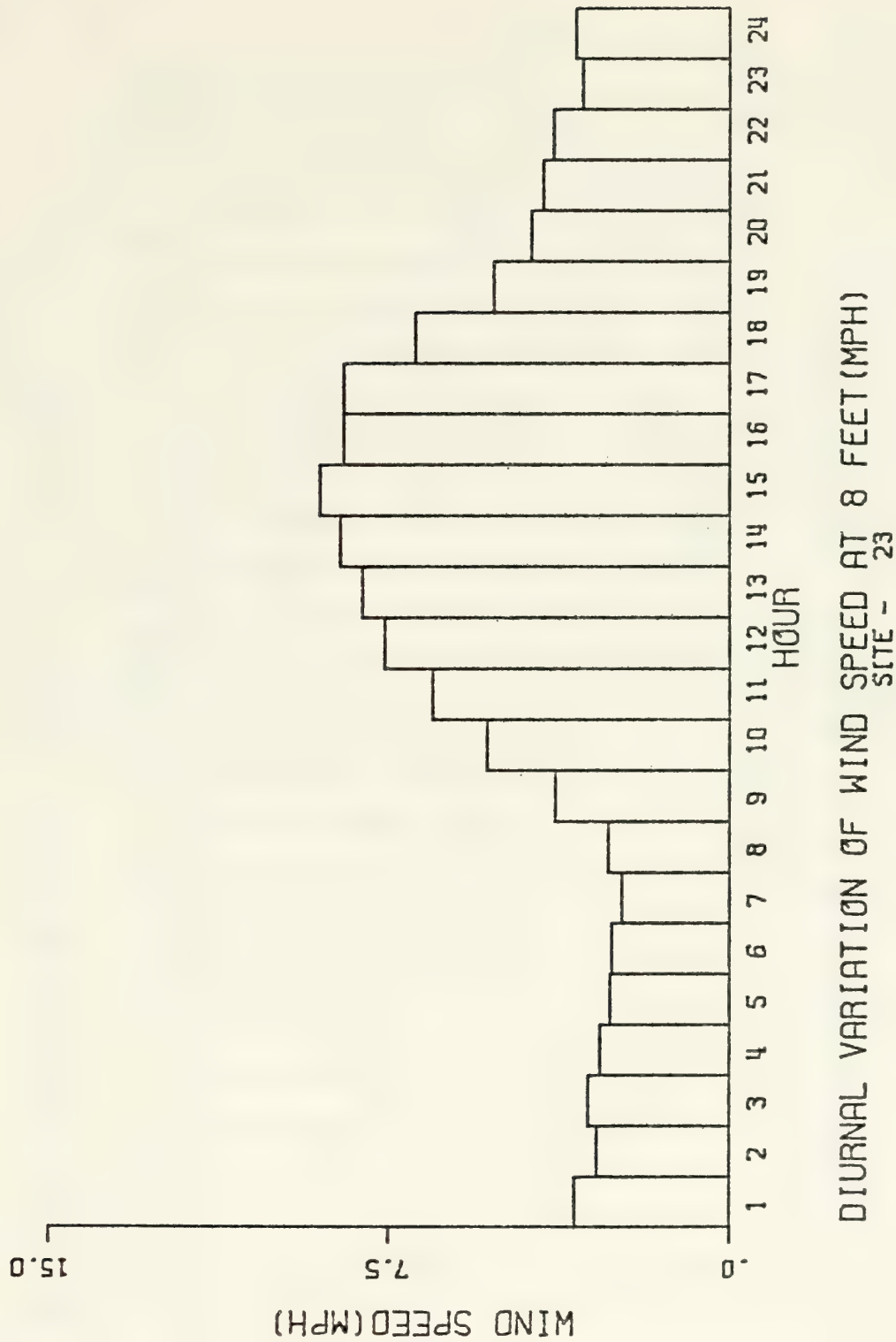
DIURNAL VARIATION OF NON-METHANE HYDROCARBONS (UG/M³ X 10³-1)
SITE - 23

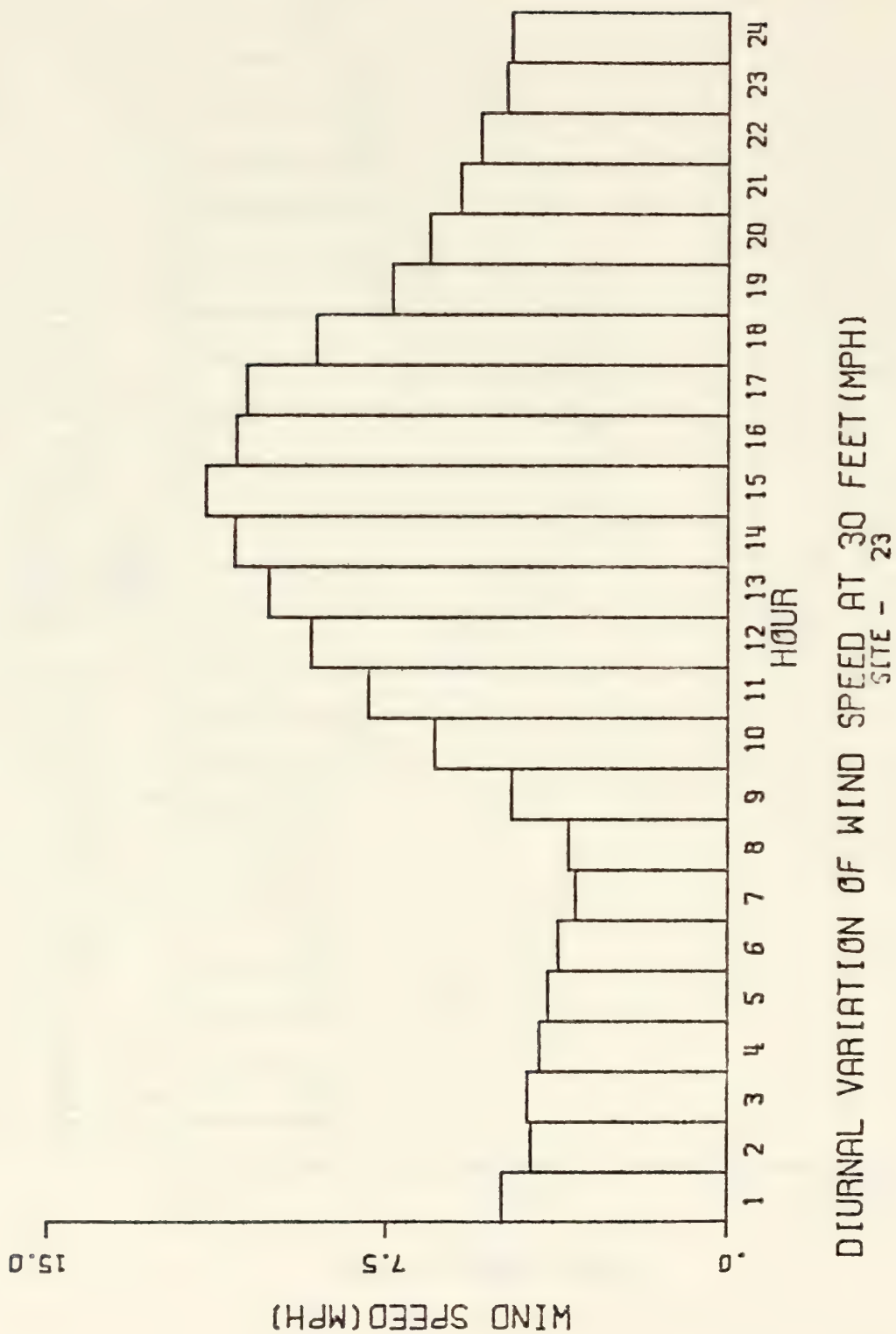


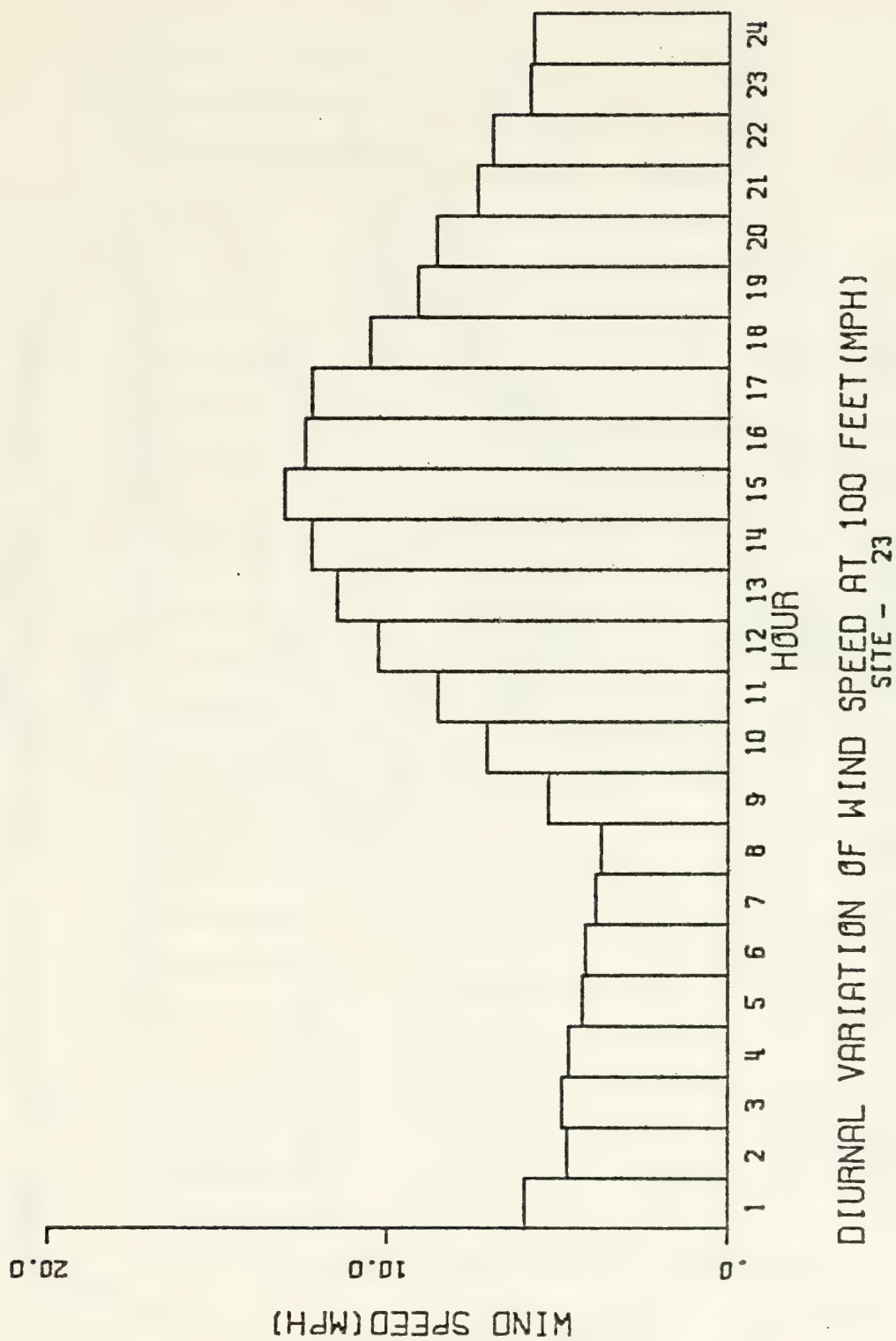


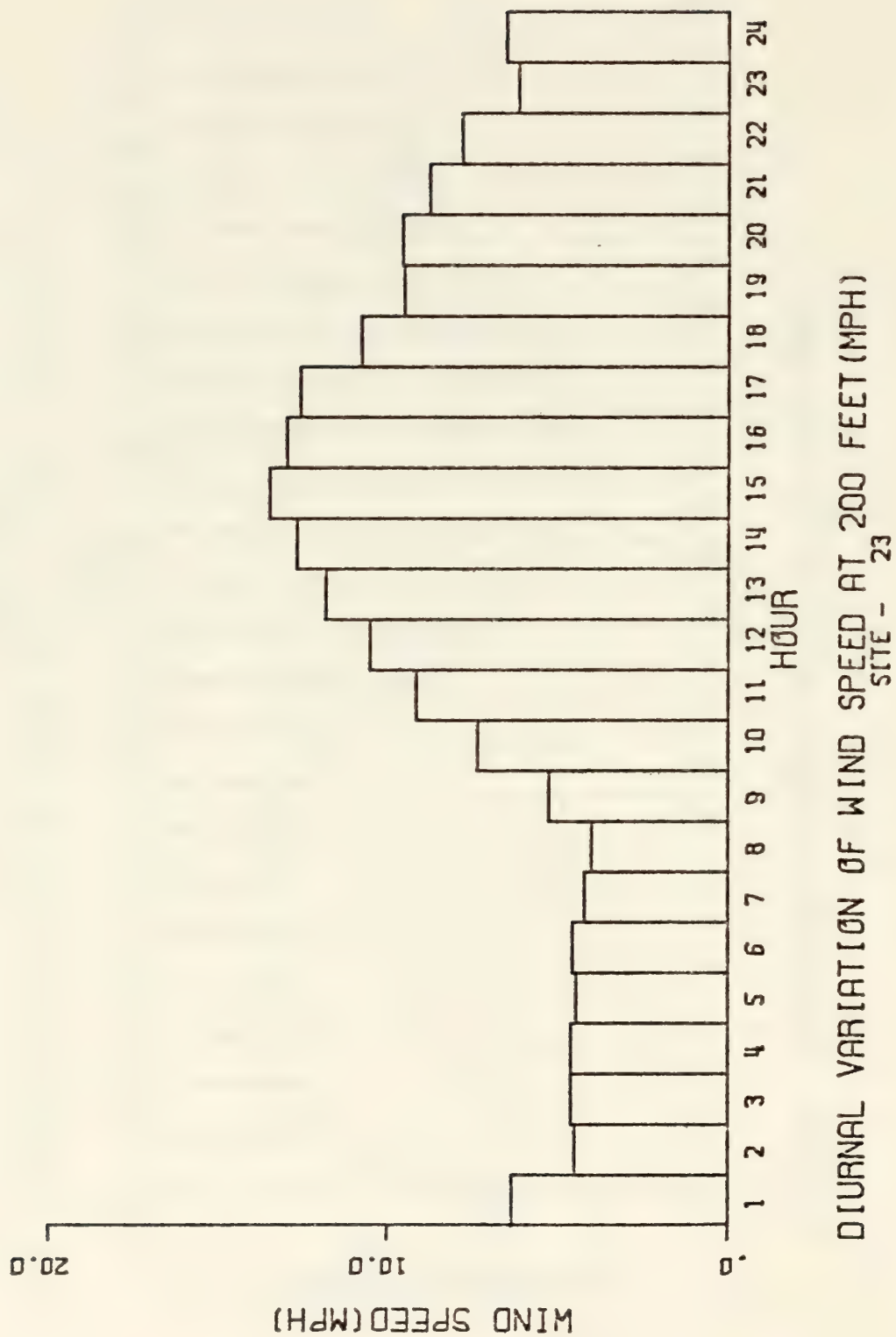


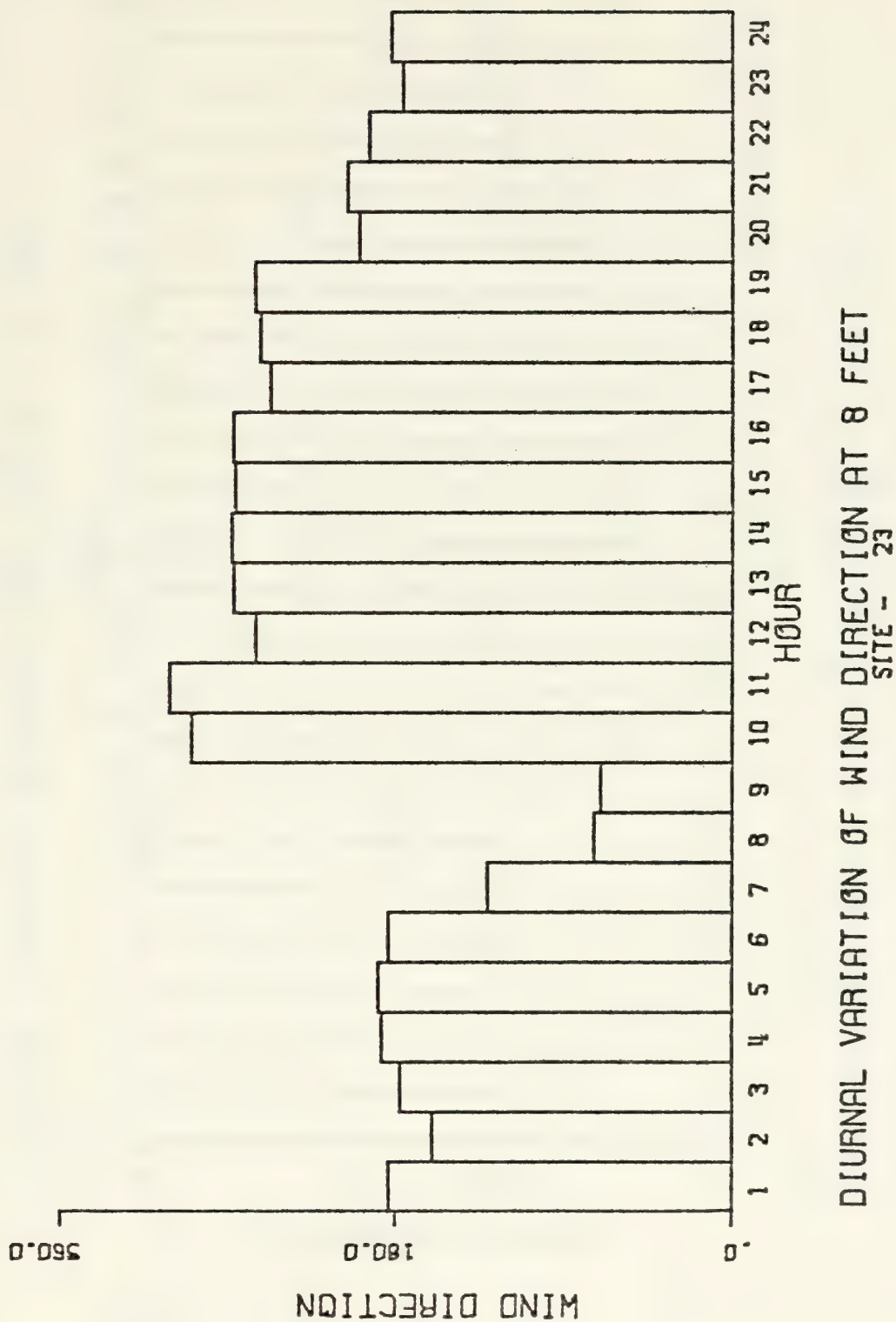
HOURLY TOTAL PRECIPITATION (HUNDREDTHS OF INCHES)
SITE - 23

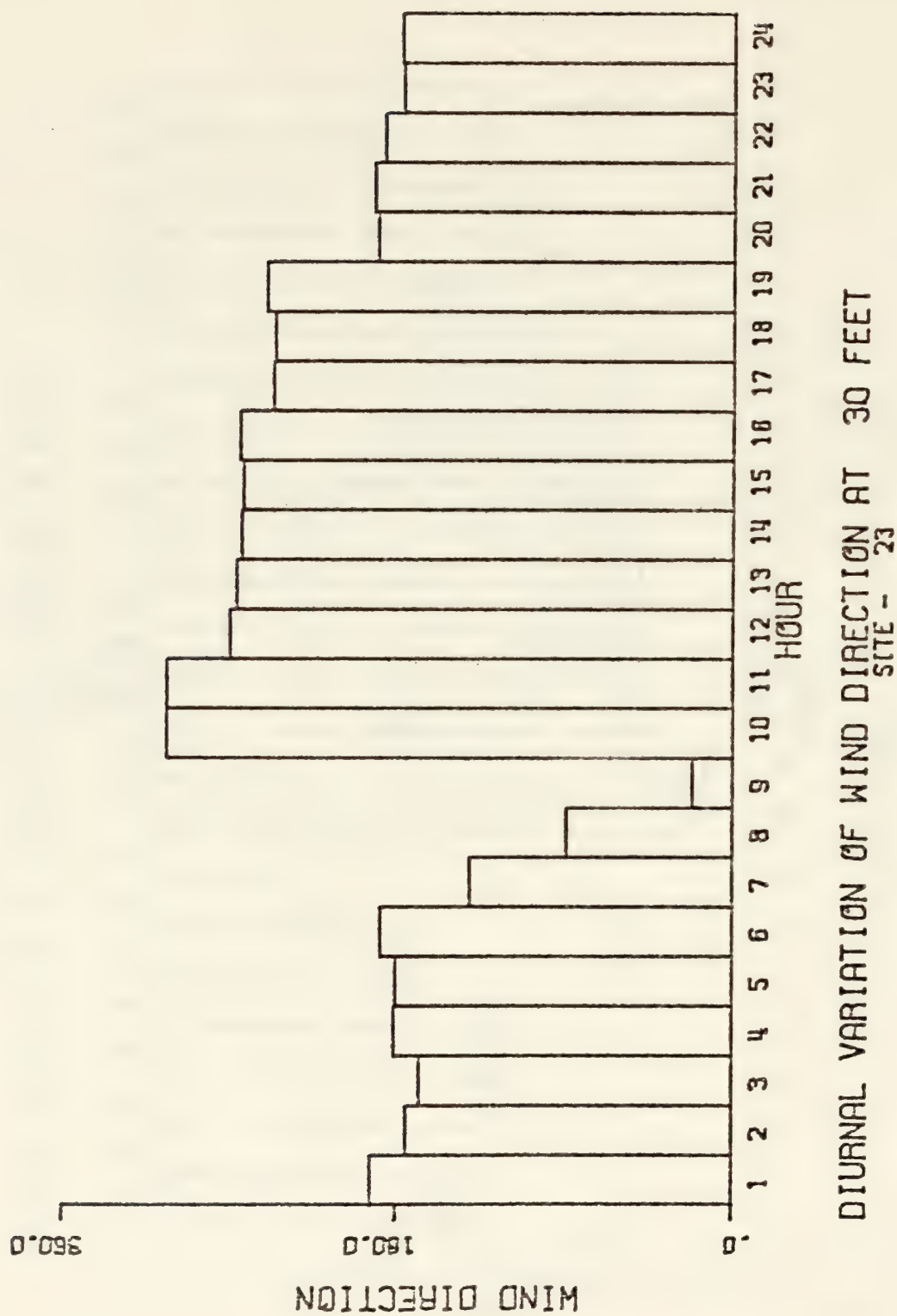


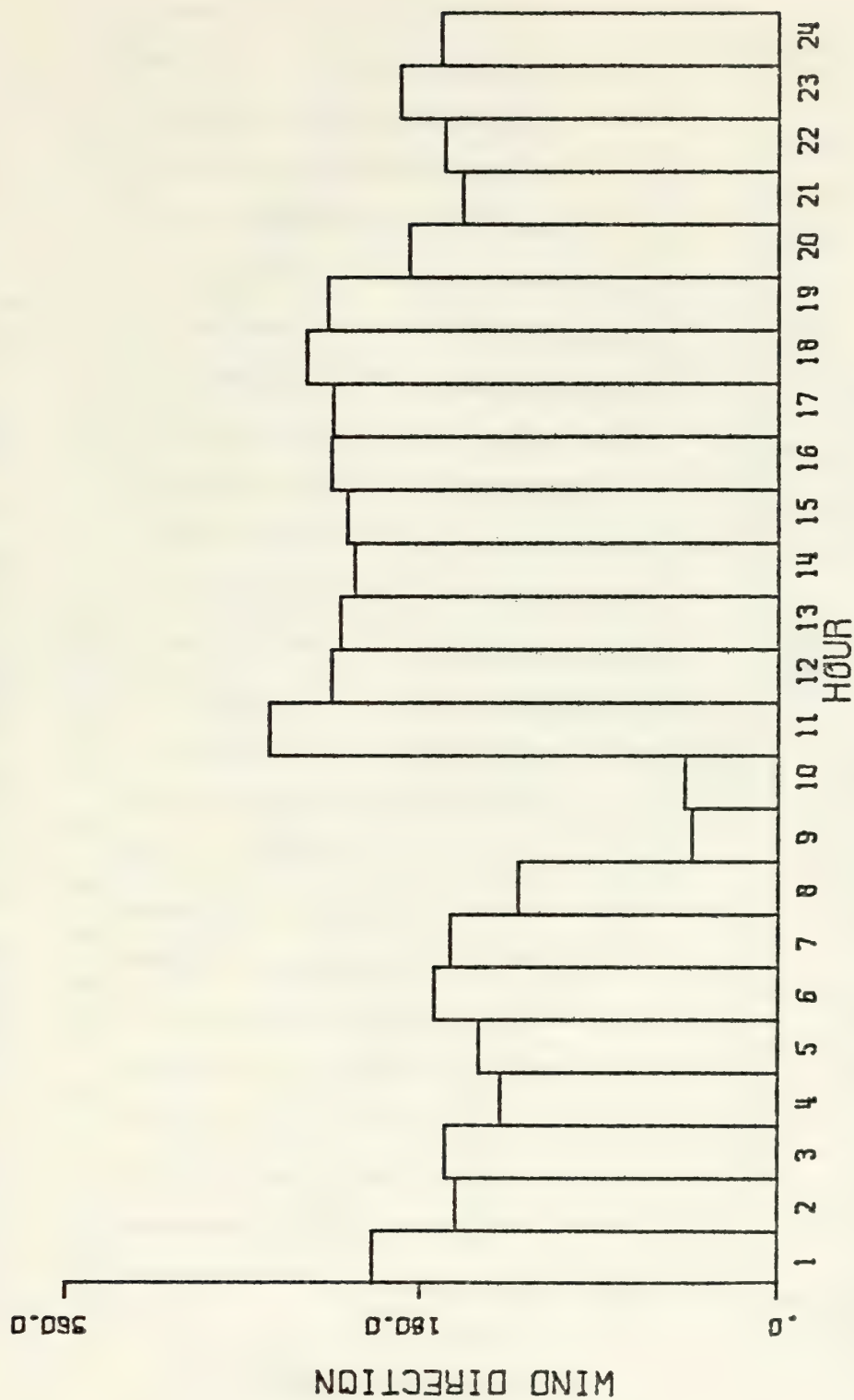




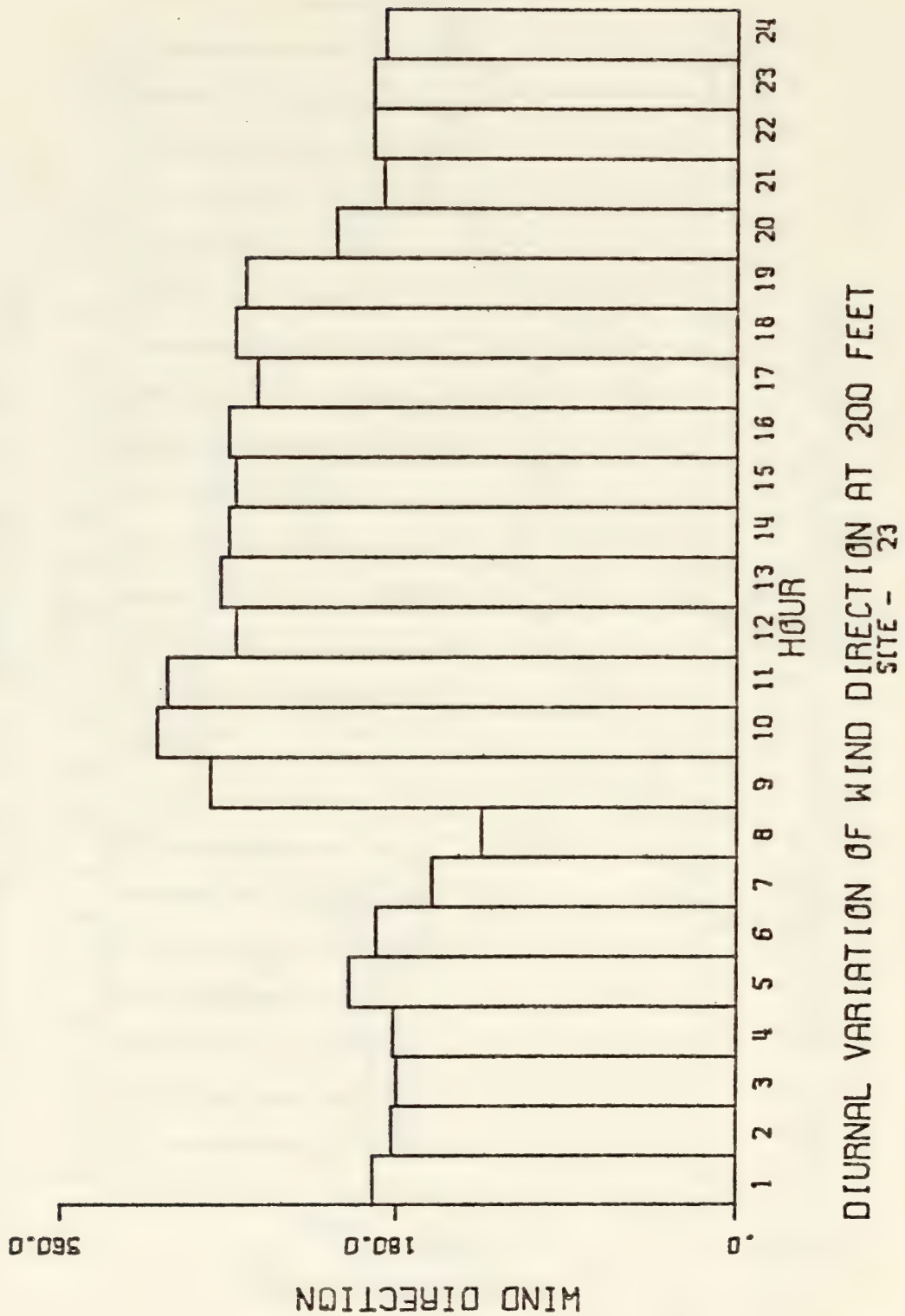


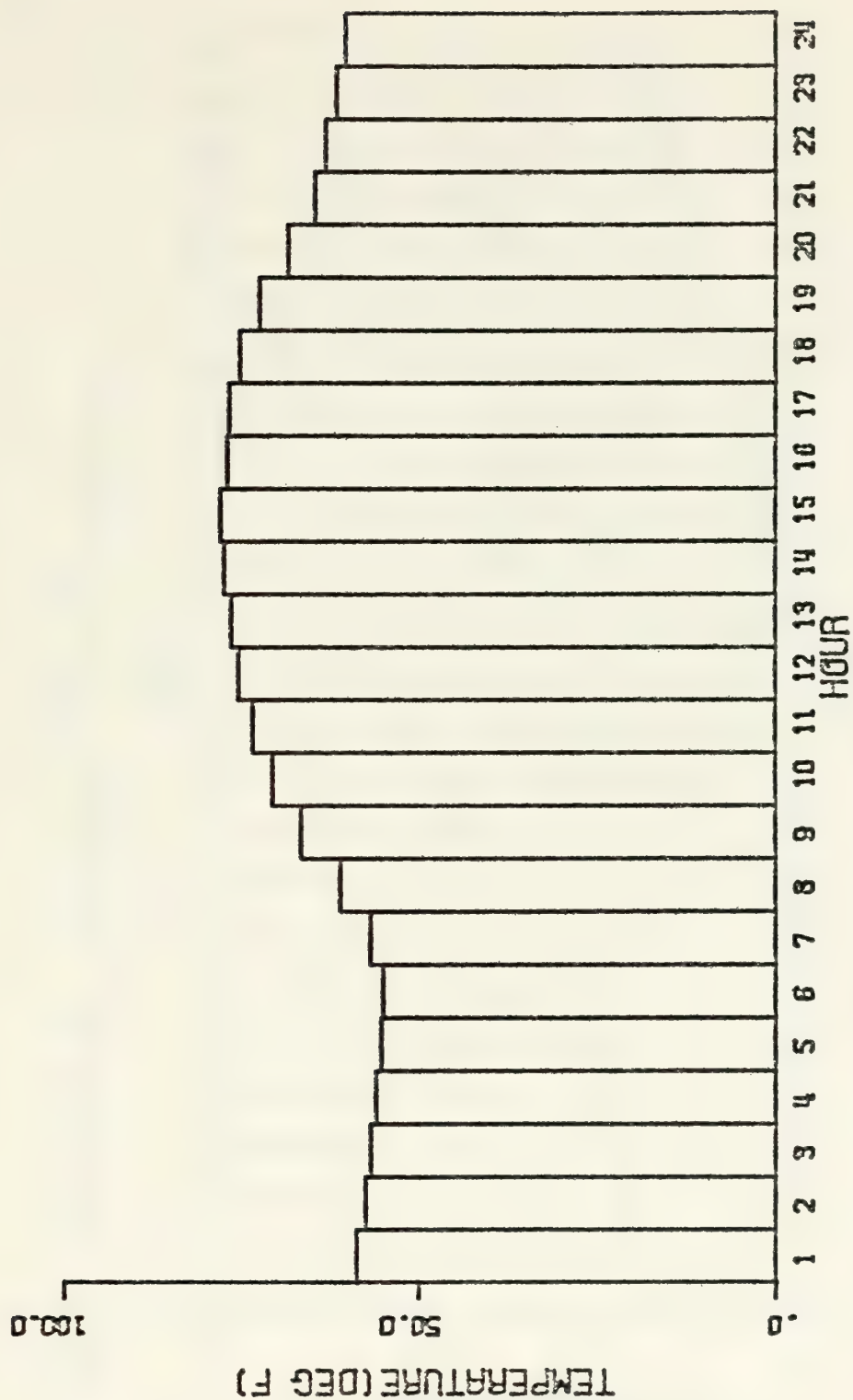




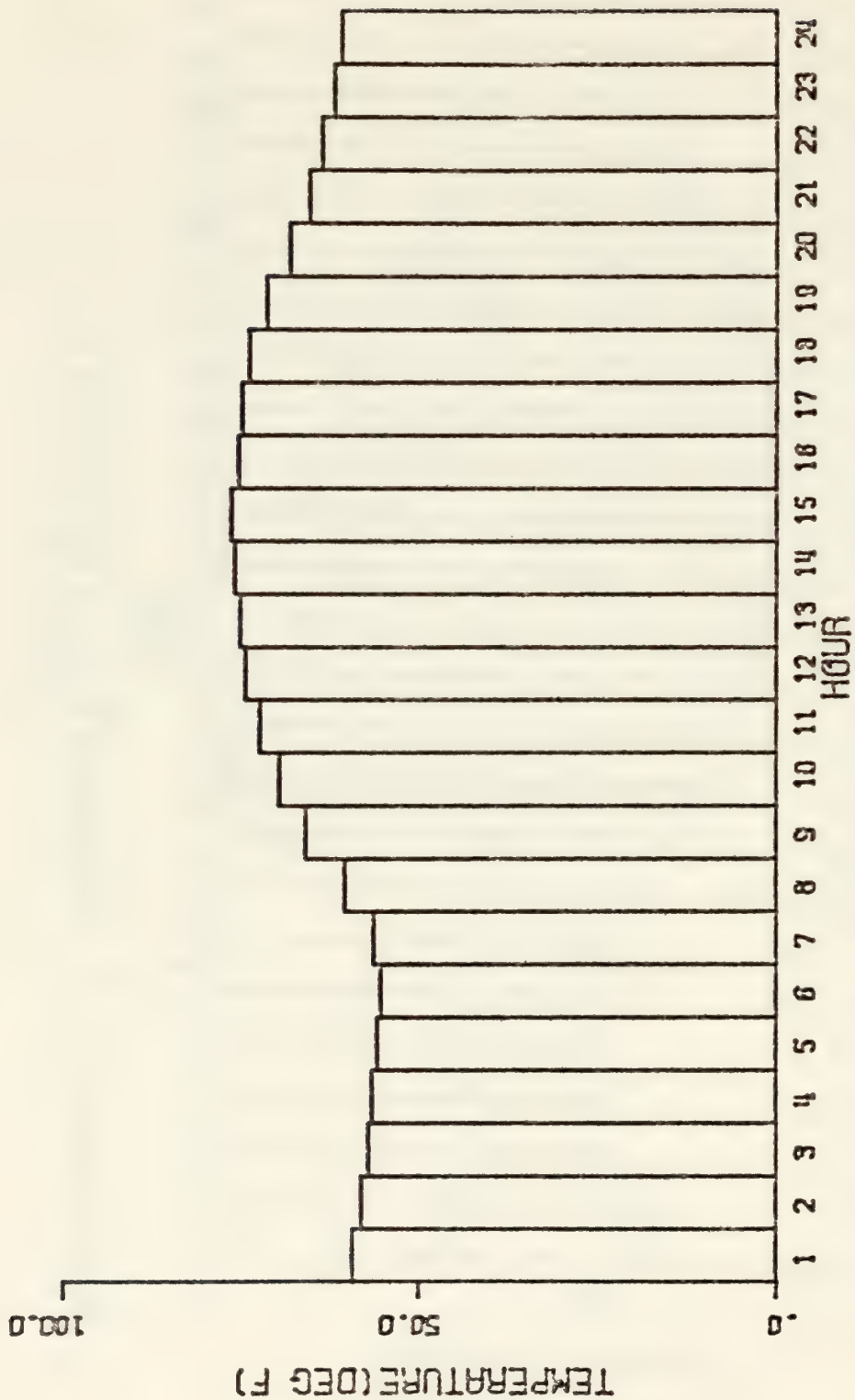


DIURNAL VARIATION OF WIND DIRECTION AT 100 FEET
SITE - 23

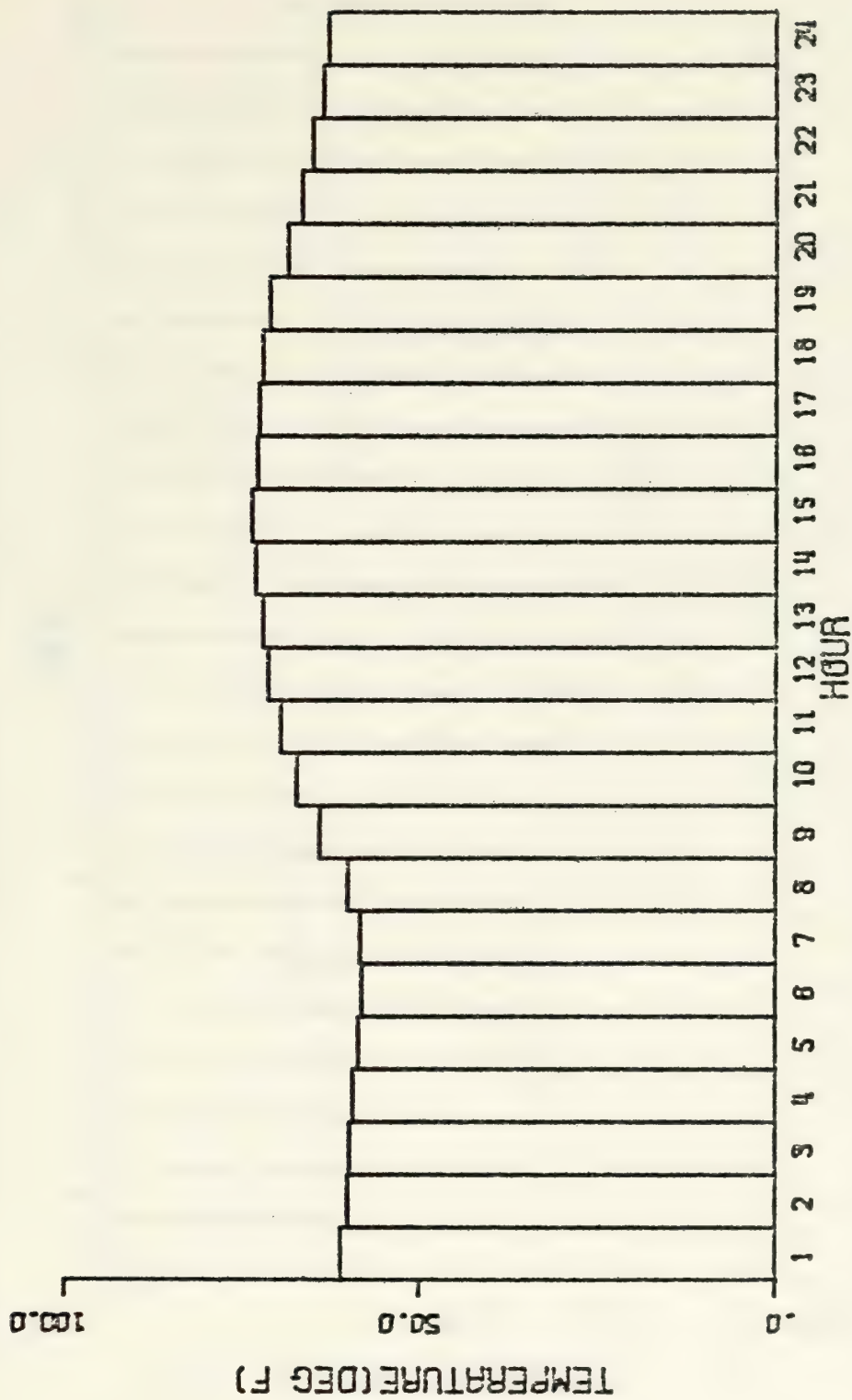




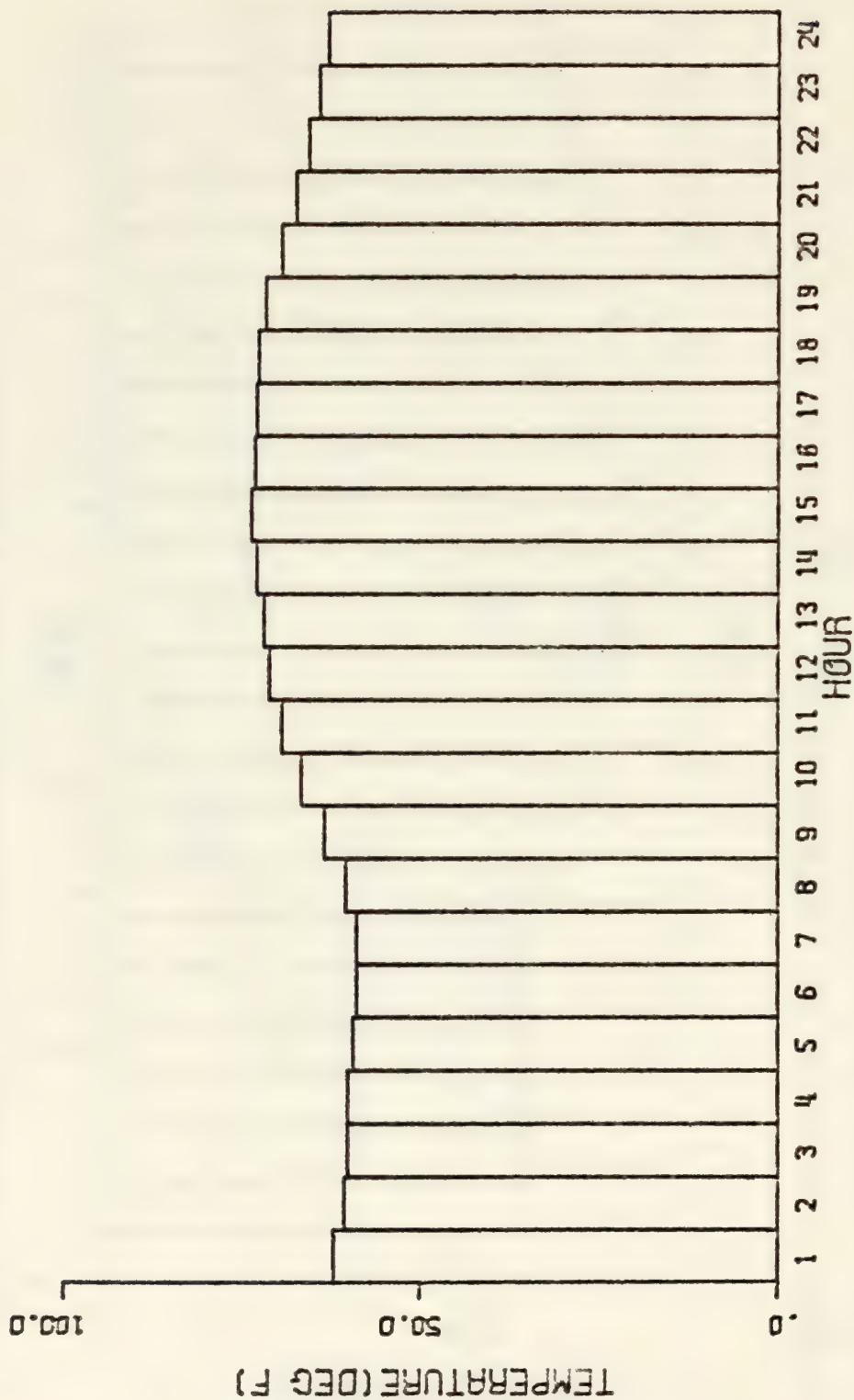
DIURNAL VARIATION OF TEMPERATURE AT 8 FEET (DEG F)
SITE - 23



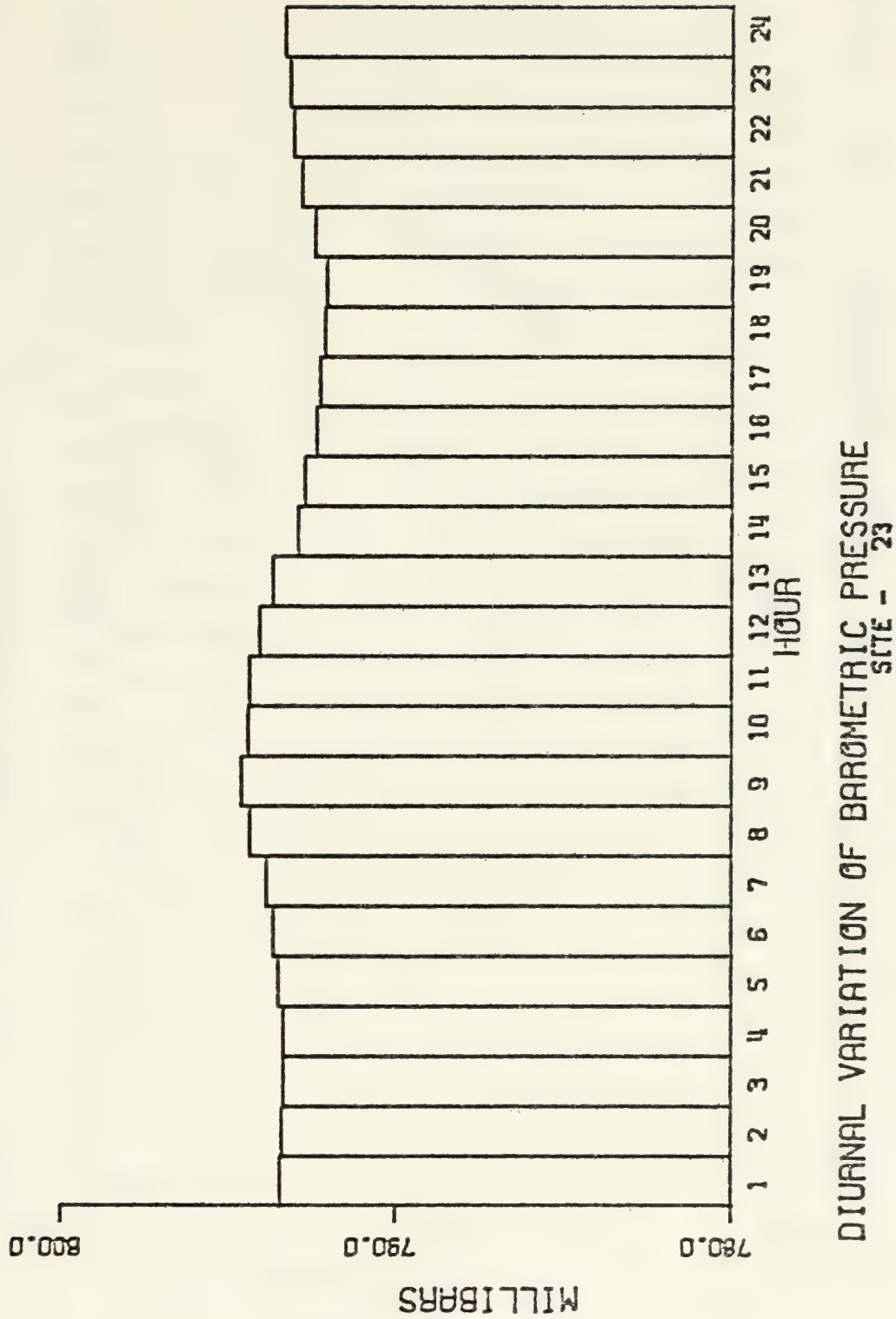
DIURNAL VARIATION OF TEMPERATURE AT 30 FEET (DEG F)
SITE - 23



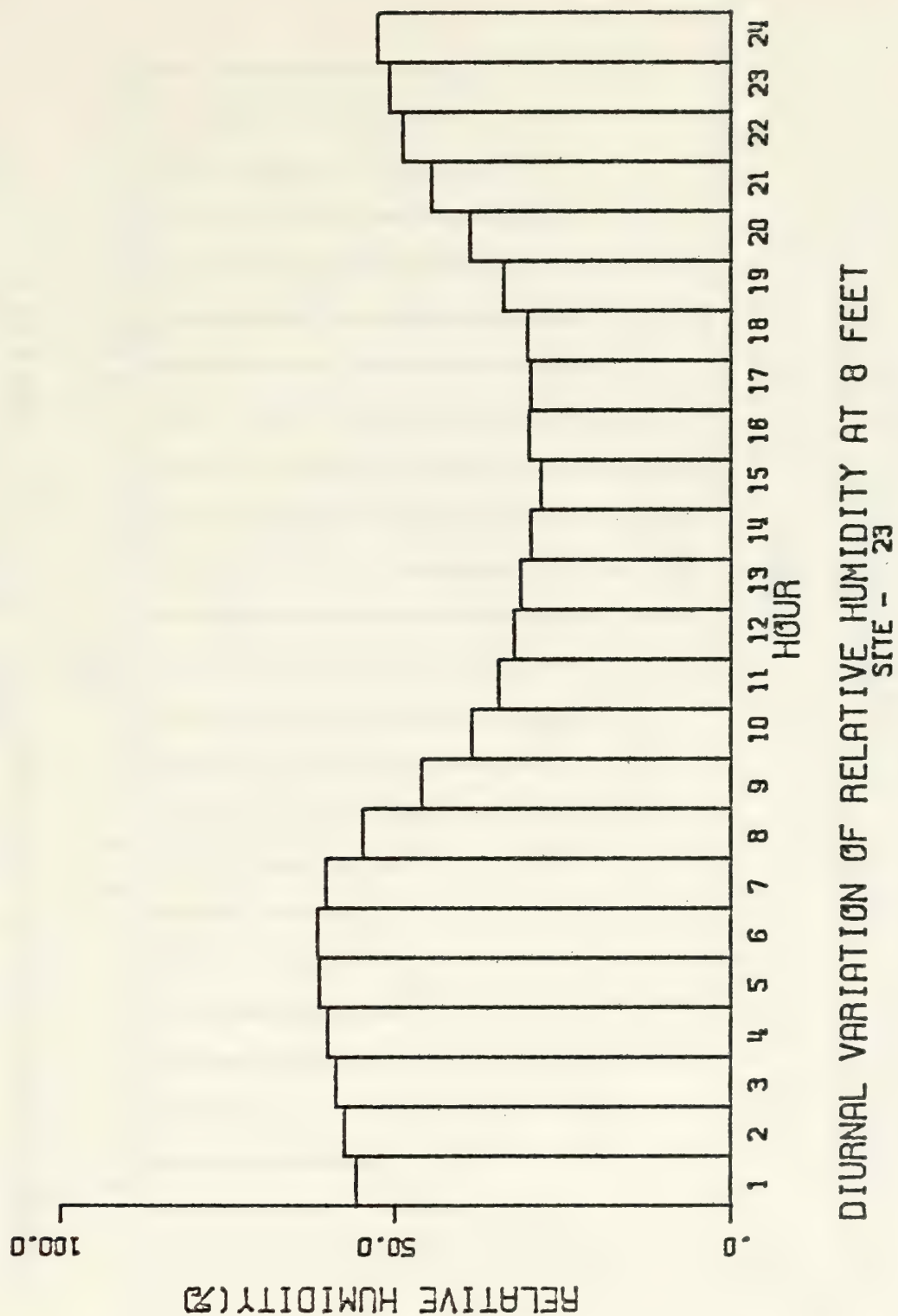
DIURNAL VARIATION OF TEMPERATURE AT 100 FEET (DEG F)
SITE - 23

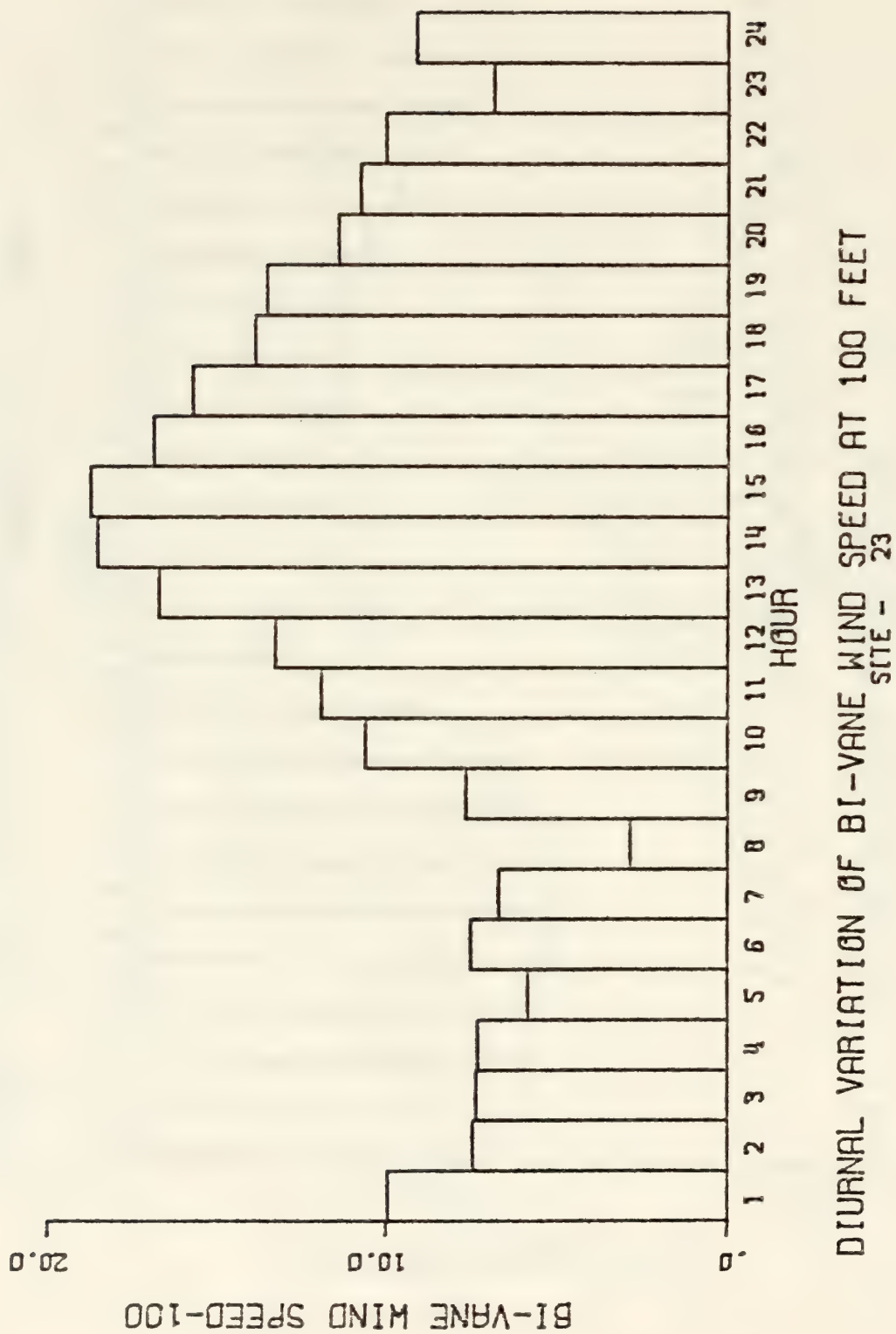


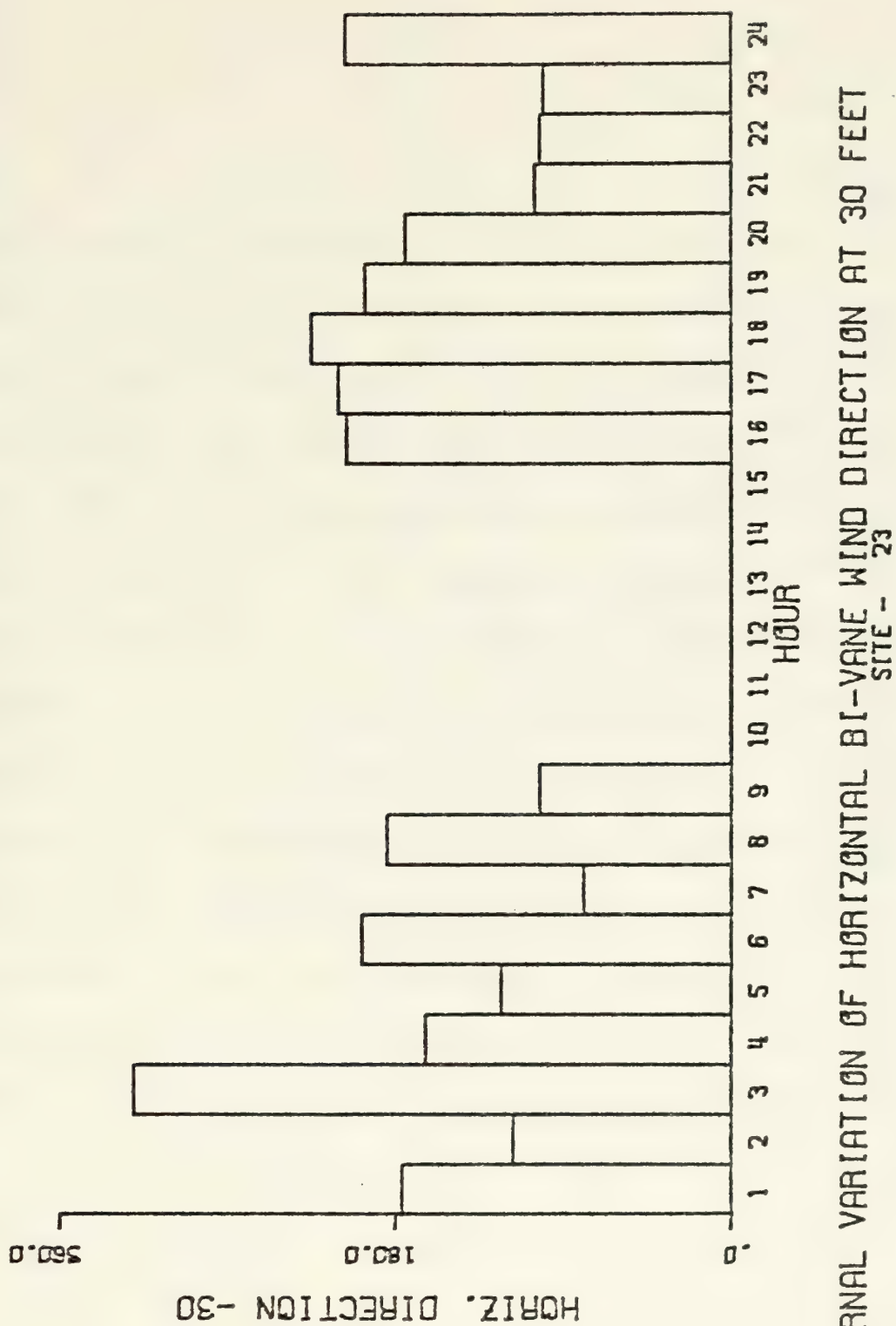
DIURNAL VARIATION OF TEMPERATURE AT 200 FEET (DEG F)
SITE - 23











DIURNAL VARIATION OF HORIZONTAL BI-VANE WIND DIRECTION AT 30 FEET
SITE - 23

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING PYRANOMETER RECORDING
PERIOD (8/1/77 TO 8/31/77)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
8/1																								
8/2																								
8/3																								
8/4																								
8/5																								
8/6																								
8/7																								
8/8																								
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8/28																								
8/29																								
8/30																								
8/31																								

* NON-ZERO PYRANOMETER READING BUT STABILITY CLASS UNCERTAIN SINCE NIGHTTIME NET RADIATION INDEX IS REQUIRED

II B-2279

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
A STABILITY CLASS

HOUR

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

8/ 1

8/ 2

8/ 3

8/ 4

8/ 5

8/ 6

8/ 7

8/ 8

8/ 9

8/10

8/11

8/12

8/13

8/14

8/15

8/16

C-H SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
A STABILITY CLASS

4
WNW

8/17
8/18
8/19
8/20
8/21
8/22
8/23
8/24
8/25
8/26
8/27
8/28
8/29
8/30
8/31

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
6 STABILITY CLASS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

8/ 1
8/ 2
8/ 3
8/ 4
8/ 5
8/ 6
8/ 7
8/ 8
8/ 9
8/10
8/11
8/12
8/13
8/14
8/15
8/16

C-R SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
B STABILITY CLASS

817

818

618

0272

8/21

22/22

13/23

4/21

8/25

8126

8127

8/24

8/29

8/30

13/31

7	3
7	2
7	2
7	2

755

5	3	5	8	10	6	7
ESE	NNW	NW	NW	NW	SSW	SSW
9	9	10	11	10	10	8
SW	NNW	SSW	SW	SW	SW	NW
8	9	10	11	10	10	9
SW	SW	SSW	SW	SW	SW	SW

4 3
2
3 2

53

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
C STABILITY CLASS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

8/ 1

8/ 2

8/ 3

8/ 4

8/ 5

8/ 6

8/ 7

8/ 8

8/ 9

8/10

8/11

8/12

8/13

8/14

8/15

8/16

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
C STABILITY CLASS

Date	Time	Direction	Speed	Distance	Remarks
8/17					
8/18					
8/19					
8/20					
8/21					
8/22		5 NW			
8/23					
8/24					
8/25					
8/26					
8/27		2 ENE			
8/28		3 NNE			
8/29		3 NW			
8/30					
8/31		1 N			
		2 N			
		8 WSW			
		13 SW			

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
D STABILITY CLASS

HOUR

[illegible]

11/1

812

8/3

8/47

5/25

816

817

20

8/9

810

811

212

A/13

44/45

815

8194

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
D STABILITY CLASS[illegible]

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
E STABILITY CLASS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

8/ 1
8/ 2
8/ 3
8/ 4
8/ 5
8/ 6
8/ 7
8/ 8
8/ 9
8/10
8/11
8/12
8/13
8/14
8/15
8/16

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
E STABILITY CLASS

[illegible]

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD(8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
F STABILITY CLASS

HOUR

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

8/ 1

8/ 2

8/ 3

8/ 4

8/ 5

8/ 6

8/ 7

8/ 8

8/ 9

8/10

8/11

8/12

8/13

8/14

8/15

8/16

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING DT/DZ (LEVEL 2)
PERIOD: 8/ 1/77 TO 8/31/77)

HOURLY WIND AND DIRECTION
F STABILITY CLASS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
8/17																															
8/18																															
8/19																															
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8/29																															
8/30																															
8/31																															

APPENDIX A
STABILITY WIND ROSE DIAGRAMS

APPENDIX A
STABILITY WIND ROSE DIAGRAMS

According to the data presented in AEC Safety Guide No. 23, the relationships between stability classes and σ_θ are as follows (the values shown are averages for each stability classification... σ_θ is the standard deviation of horizontal wind direction fluctuations).

<u>Stability Classification</u>	<u>Pasquill Categories</u>	<u>Average Values σ_θ (degrees)</u>
Extremely Unstable	A	25.0°
Moderately Unstable	B	20.0°
Slightly Unstable	C	15.0°
Neutral	D	10.0°
Slightly Stable	E	5.0°
Moderately Stable	F	2.5°

Stability wind roses obtained at the trailers in the monitoring network are displayed in the following tables. Because of the relatively low heights above the surface (9 meters) at which the wind data is taken, the stability distributions are skewed toward the unstable end of the spectrum. That is, the unstable classes (A, B, and C) have a much higher frequency of occurrence than would be obtained with the Pasquill method of stability categorization (or with instruments at higher levels).

Table 1 depicts the frequency distribution of Pasquill stability categories based on σ_θ from data collected by M. M. Pendergast and T. V. Crawford at the Savannah River Plant ("Actual Standard Deviations of Vertical and Horizontal Wind Direction Compared to Estimates from Other Measurements", Symposium on Atmospheric Diffusion and Air Pollution, September 9-13, 1974). Three distinct range patterns of stability class

distributions were observed: low, mid, and high, according to the height at which the σ_θ measurements were taken.

TABLE 1
FREQUENCY DISTRIBUTION OF PASQUILL STABILITY CATEGORIES

Height, ft	Stability Categories based on σ_z							
	A $\sigma_z > 23$	B $18 \leq \sigma_z < 23$	C $13 \leq \sigma_z < 18$	D $8 \leq \sigma_z < 13$	E $4 \leq \sigma_z < 8$	F $2 \leq \sigma_z < 4$	G $\sigma_z < 2$	
10	22.6	13.9	21.8	23.9	8.9	0.4	3.5	LOW RANGE
35	19.3	11.3	19.4	32.4	15.9	0.7	0.5	
91	9.6	6.7	13.5	21.7	29.5	15.4	2.5	MID RANGE
137	9.3	5.3	11.7	20.8	28.5	18.4	5.5	
182	7.0	2.9	6.8	17.1	25.9	25.5	14.7	HIGH RANGE
243	7.7	4.3	9.4	17.7	27.5	22.9	10.4	
304	7.2	3.7	8.0	17.2	23.7	23.9	11.3	

Also, Figure 1 (from D. H. Slade, Meteorology and Atomic Energy, 1968, p. 52) demonstrates that the line representing very stable conditions (which by their nature are associated with light winds) branches into three separate lines near the ground. The curve at the left represents the smallest values of σ_θ usually observed. The curve that branches off to the right reflects the contribution of very low-level wind direction meander to the total standard deviation. These meandering oscillations decrease in amplitude very rapidly with height under stable conditions. The central curve represents typical inversion conditions. Actually, for a given stability condition, values of σ_θ will always be greater when the wind is light than when it is strong. This phenomena is most noticeable in the lowest layers.

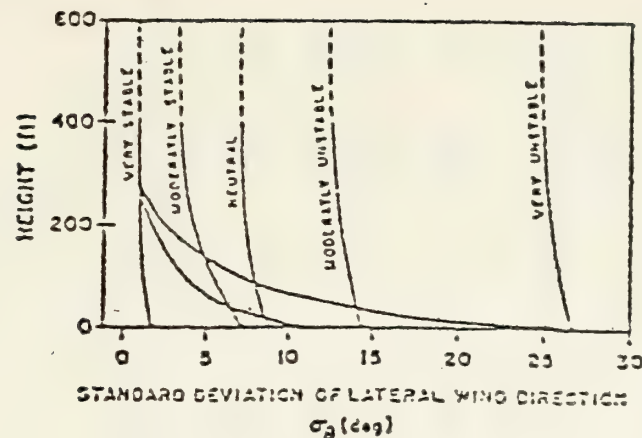


FIGURE 1

The vertical variation of the lateral wind-direction standard deviation (σ_θ) for various stability regimes. The curves represent average or typical conditions with the exception of the two outer "very stable" lines, which represent extremes.

The large surface values of σ_θ for unstable conditions do not decrease very rapidly with height. As in the case of very stable conditions, the greatest lateral fluctuations during a very unstable thermal structure occur with very light winds. As a general rule, for a given insolation condition, increasing wind speeds are associated with profiles of σ_θ that tend toward neutral stability.

The majority of the trailers in the network recorded very light winds throughout the month. Therefore, the stability distributions had a predominance of high σ_θ values and, hence, unstable classifications. Those trailers with the highest average winds (and fewest nearby obstacles to the flow) generally had the more reasonable and representative low-level stability class distributions.

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 8 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - A

GROUP MAX SPEED MPH	WIND DIRECTION																	TOTAL	%
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
GT 24	:	9	6	7	6	5	7	6	10	11	10	9	8	8	11	8	8	:	0.
18 - 24	:																	:	0.
12 - 18	:																	:	0.
7 - 12	:	8		1			1		3	3	6	3	3	2	4	4	3	:	41 8.
3 - 7	:	20	25	18	15	12	5	10	9	6	12	15	10	15	19	27	24	:	242 48.
LT 3	:	11	11	18	17	16	16	18	17	18	9	13	10	11	14	16	10	:	225 44.
TOTAL	:	39	36	37	32	28	22	28	29	27	27	31	23	28	37	47	37	:	508
PERCENT	:	8.	7.	7.	6.	6.	4.	6.	6.	5.	5.	6.	5.	6.	7.	9.	7.	:	100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 31(6.10 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 8 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - B

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION								NNW	NW	TOTAL	%
									S	SSW	SW	WSW	W	WNW	NW	NNW				
GT 24 :	8	7	6	6	4	4	5	8	6	12	15	7	9	14	8	11				
18 - 24 :																				0.
12 - 18 :									1	4				1						0.
7 - 12 :	4	3						1	8	12		1	3	6	6	6				6 2.
3 - 7 :	14	11	6	7	3	5	3	9	4	10	4	5	5	9	18	12				50 19.
LT 3 :	3	6	14	2	6	6	7	5	9	1	3	3	3	4	2	3				125 48.
TOTAL :	21	20	20	9	9	11	10	15	13	20	23	9	11	20	26	21				77 30.
PERCENT :	8.	8.	8.	3.	3.	4.	4.	6.	5.	8.	9.	3.	4.	8.	10.	8.				100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 10(3.88 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT

LEVEL = 8 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - C

GROUP MAX SPEED MPH		WIND DIRECTION																NNW	NW	WNW	W	WSW	SW	SSW	S	SSE	SE	ESE	E	ENE	NE	NNE	N	TOTAL	%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
GT	24	:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 13(1.07 %)

C-B SHALE OIL PROJECT
LEVEL = 8 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - D

GROUP	MAX SPEED MPH	WIND DIRECTION																TOTAL	%	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW			
GT	24	:																:	0.	
18 -	24	:																:	4 0.	
12 -	18	:	1						2	13	37	52	5	1		2	5	:	118 6.	
7 -	12	:	23	15	7	1			3	26	91	119	74	27	16	16	36	28	:	482 26.
3 -	7	:	33	30	15	38	31	55	61	76	85	96	120	46	27	26	32	21	:	792 43.
LT	3	:	14	20	21	26	24	39	46	41	40	60	58	18	10	4	4	8	:	433 24.
TOTAL		:	71	65	43	65	55	94	110	145	229	314	306	96	54	46	74	62	:	1829
PERCENT		:	4.	4.	2.	4.	3.	5.	6.	8.	13.	17.	17.	5.	3.	3.	4.	3.	:	100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 31(1.69 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT

LEVEL = 8 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - E

GROUP	MAX SPEED	WIND DIRECTION																NNW	NW	TOTAL	%							
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW													
GT	24	:								1										:					1	0.		
18 -	24	:								0	1	1								:						2	0.	
12 -	18	:								6	11	12	4	1				2	6	:						44	3.	
7 -	12	:								6	72	41	19	5	8			17	33	:						238	16.	
3 -	7	:								45	10	11	22	22	39	67	48	79	80		149	47	28	24	40	50	761	50.
LT	3	:								24	22	14	15	23	26	50	38	34	50		94	33	11	13	11	30	488	32.
TOTAL		:								89	32	25	37	45	65	117	92	192	183		275	103	45	45	70	119	1534	
PERCENT		:								6.	2.	2.	2.	3.	4.	8.	6.	13.	12.		18.	7.	3.	3.	5.	8.		100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 34(2.22 %)

STABILITY WIND ROSE DIAGRAM

C-H SHALF OIL PROJECT

LEVEL = 8 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - TOTAL

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION								NNW	NW	TOTAL	%
								SSW	S	SSW	SW	WSW	W	WNW	NW				
GT 24	:								1							:		1 0.	
1R - 24	:								0	3	4		1			:		8 0.	
12 - 18	:	4						2	21	97	114	18	3	2	5	16 :	282 5.		
7 - 12	:	80	23	12	2		3	40	192	285	205	78	38	55	102	109 :	1225 23.		
3 - 7	:	136	108	66	100	91	147	171	169	205	245	126	97	103	169	137 :	2405 45.		
LT 3	:	63	80	87	73	87	109	138	124	118	138	181	44	42	40	56 :	1452 27.		
TOTAL	:	283	211	165	175	178	257	312	335	537	768	839	183	202	316	318 :	5373		
PERCENT	:	5.	4.	3.	3.	3.	6.	6.	6.	10.	14.	16.	5.	4.	6.	6.	100.		

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 119(2.21 %)

PERCENTAGE OF A	STABILITY -	9.45 %
PERCENTAGE OF B	STABILITY -	4.80 %
PERCENTAGE OF C	STABILITY -	22.52 %
PERCENTAGE OF D	STABILITY -	34.04 %
PERCENTAGE OF E	STABILITY -	28.55 %

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 30 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - A

GROUP MAX SPEED MPH		WIND DIRECTION												NNW	NW	WNW	W	WSW	SW	SSW	S	SSE	SE	ESE	E	ENE	NE	NNE	N	TOTAL	%	
GT	24	:																														0.
18 -	24	:																														0.
12 -	18	:																														0.
7 -	12	:																														0.
3 -	7	:																														0.
LT	3	:																														0.
TOTAL		:																														0.
PERCENT		:																														0.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 2(0.62 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 30 FEET PERIOD(6/ 1/77 TO 8/31/77)

STABILITY CLASS - B

GROUP MAX SPEED MPH		WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
GT 24	:	11	7	5	7	6	6	4	11	6	13	11	7	13	8	10	10		0.
18 - 24	:																		0.
12 - 18	:										1			1				2	1.
7 - 12	:	6	1		1				4		1	4	1	2	1	8	5	34	20.
3 - 7	:	8	13	6	4		3	4	4	7	2	4	7	2	7	9	8	92	55.
LT 3	:	3	4	6	1	2	6	4	1	2	2	1	1	3	2	0	2	40	24.
TOTAL	:	17	18	12	6	6	9	8	9	9	6	9	9	8	10	17	15	168	
PERCENT	:	10.	11.	7.	4.	4.	5.	5.	5.	5.	4.	5.	5.	5.	6.	10.	9.	100.	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 10 0.60 %)

STABILITY WIND ROSE DIAGRAM

C-H SHALE OIL PROJECT
LEVEL = 30 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - C

GROUP	MAX SPEED MPH	WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
GT	24	:									2	7	1		1			:	0
18 -	24	:																:	
12 -	18	:	3							2	26	28	8		3	6	8	:	84
7 -	12	:	25	4	3	1	1	2		9	34	26	11	14	16	25	34	:	205
3 -	7	:	14	27	20	12	16	22	11	10	12	20	14	9	13	28	17	:	258
LT	3	:	7	5	9	6	8	15	7	10	3	3	4	1	3	3	4	:	93
TOTAL		:	49	36	32	19	24	38	20	20	77	84	38	24	36	62	63	:	651
PERCENT		:	8.	6.	5.	3.	4.	6.	3.	3.	12.	13.	6.	4.	6.	10.	10.	:	100

.....
TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 6(0.92 %)

STABILITY WIND ROSE DIAGRAM

C-H SHALE OIL PROJECT

LEVEL = 30 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - D

GROUP MAX SPEED F.P.H	WIND DIRECTION																NNW	TOTAL	%
	N	NNE	NE	ENE	E	ESE	SE	SEF	S	SSW	SW	WSW	W	WNW	NW				
GT 24 :	13	15	14	9	7	7	11	17	18	21	26	20	22	16	19	23	3	0.	
18 - 24 :									1	7	25	2	1		2	4	42	3.	
12 - 18 :		8	3					4	25	77	79	15	3	5	6	13	246	18.	
7 - 12 :	27	7	4	2	3	2	7	11	54	92	61	27	16	21	37	43	414	30.	
3 - 7 :	13	37	19	26	32	44	40	42	42	69	58	24	22	24	16	18	526	38.	
LT 3 :	9	6	6	5	9	17	12	6	15	14	13	6	8	2	2	8	138	10.	
TOTAL :	57	58	32	33	44	63	59	63	137	259	239	74	50	52	63	86	1369		
PERCENT :	4.	4.	2.	2.	3.	5.	4.	5.	10.	19.	17.	5.	4.	4.	5.	6.	100.		

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 5(0.37 %)

STABILITY WIND ROSE DIAGRAM

C-H SHALE OIL PROJECT
LEVEL = 30 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - E

GROUP	MAX SPEED	WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
GT	24	15	14	14	9	8	8	17	20	21	21	23	20	16	19	22	:	0	
18 -	24	:	:	:	:	:	:	:	3	8	18	4	1	:	1	2	:	37	2
12 -	18	:	9	3	3	4	:	4	57	43	67	13	4	3	15	20	:	241	11
7 -	12	:	46	7	3	4	8	10	48	117	101	73	23	22	37	43	:	577	26
3 -	7	:	50	28	32	40	91	109	126	77	146	169	32	39	25	35	:	1101	49
LT	3	:	14	10	8	6	11	17	30	25	40	39	12	9	9	15	:	296	13
TOTAL		:	119	48	46	49	79	116	149	203	296	338	366	84	75	69	97	118	2252
PERCENT		:	5.	2.	2.	4.	5.	7.	9.	13.	15.	16.	4.	3.	3.	4.	5.	:	100

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 2(0.08 %)

STABILITY WIND ROSE DIAGRAM

C-H SHALE OIL PROJECT
LEVEL = 30 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - TOTAL

GROUP	MAX SPEED MPH	WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
GT	24	:	:	:	:	:	:	:	:	4	17	50	7	2	1	3	6	:	3 0.
18 -	24	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	90 2.
12 -	18	:	20	11	6	:	:	:	6	84	148	174	36	9	12	27	41	:	576 12
7 -	12	:	107	20	10	8	7	11	21	66	181	231	166	65	72	110	127	:	1258 26
3 -	7	:	101	120	88	94	124	167	171	189	153	235	261	83	76	104	96	:	2149 45
LT	3	:	38	30	38	24	45	69	62	46	80	65	58	27	28	21	33	:	691 14
TOTAL		:	266	181	142	126	176	247	254	309	502	696	712	218	188	265	303	:	4767
PERCENT		:	6.	4.	3.	3.	4.	5.	5.	6.	11.	15.	15.	5.	4.	6.	6.	:	100

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 16(0.34 %)

PERCENTAGE OF A	STABILITY -	6.73 %
PERCENTAGE OF B	STABILITY -	3.52 %
PERCENTAGE OF C	STABILITY -	13.66 %
PERCENTAGE OF D	STABILITY -	28.72 %
PERCENTAGE OF F	STABILITY -	47.24 %

STABILITY WIND ROSE DIAGRAM

C-H SHALE OIL PROJECT

LEVEL = 100 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - A

STABILITY CLASS - A	GROUP MAX SPEED KPH	WIND DIRECTION												TOTAL	%				
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW			W	WNW	NW	NNW
	GF 24	3	3	5	3	2	2	7	11	5	14	11	8	6	6	6	3	:	0.
	18 - 24	:																:	0.
	12 - 18	:									1							:	1 1.
	7 - 12	:						1	1		0	2	1					:	5 5.
	3 - 7	:	1	2	3	1		2	3	8	5	4	2	2	2	5	2	:	42 45.
	LI 3	:	3	2	2	5		3	7	3	4	2	3	4	2	2	0	:	49 51.
	TOTAL	:	4	4	5	6	6	1	6	11	11	10	8	6	6	4	7	:	97
	PERCENT	:	4.	4.	5.	6.	6.	1.	6.	11.	11.	10.	8.	6.	6.	4.	7.	:	100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 0 (0.00 %)

STABILITY WIND ROSE DIAGRAM

C-H SHALE OIL PROJECT
LEVEL = 100 FEET PERIOD (8/ 1/77 TO 8/31/77)

STABILITY CLASS - B

STABILITY CLASS	GROUP	MAX SPEED MPH	WIND DIRECTION																TOTAL	%	
			N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NNW	NW			
	GT	24	:	7	3	3	4	0	0	0	7	9	4	12	0	8	6	10	9	:	0.
	18 -	24	:																	:	0.
	12 -	18	:											1						:	0.
	7 -	12	:	1					1	2				0		1		3	2	:	10 29.
	3 -	7	:	4	1	2	1		2	1	1			1		0	3	1	0	:	17 49.
	LT	3	:	0	1	2	0		1	1	0			0		1	0	1	0	:	7 20.
	TOTAL		:	5	2	4	1	0	0	0	4	4	1	2	0	2	3	5	2	:	35
	PERCENT		:	14.	6.	11.	3.	0.	0.	0.	11.	11.	3.	6.	0.	6.	9.	14.	6.	:	100.

.....
TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 00 0.00 %

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT

LEVEL = 100 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - C

GROUP MAX SPEED
MPH

	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION								NNW	NW	TOTAL	%
								SSW	S	SSW	SW	WSW	W	WNW	NW				
GT 24	7	4	3	4	5	6	7	7	15	25	24	20	15	16	13			2	1.
18 - 24								2	6	1								9	5.
12 - 18								3	11	10	0	1	5	1				31	16.
7 - 12	1						1	1	2	11	11	1	1	3	4	2		43	23.
3 - 7	7	6	7	7	3	3	1	4	2	7	7	1	1	5	10	10		81	42.
LT 3	2	0	5	3	2	0	1	3	2	2	1	0	1	1	1	1		25	13.
TOTAL	10	6	12	10	5	3	3	8	9	34	36	3	4	14	21	13		191	
PERCENT	5.	3.	6.	5.	3.	2.	2.	4.	5.	18.	19.	2.	2.	7.	11.	7.		100.	

..... TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 0(0.00 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALF OIL PROJECT
LEVEL = 100 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - D

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION								NNW	TOTAL %
								SSE	S	SSW	SW	WSW	W	WNW	NW		
GT 24 :	13	8	6	4	5	6	7	16	24	29	24	12	11	13	17	18	8 2.
18 - 24 :									8	27	13					1 :	49 10.
12 - 18 :	2							6	25	78	32	1		4	9	11 :	168 35.
7 - 12 :	2	1					1	10	20	31	9	0	2	11	16	12 :	115 24.
3 - 7 :	10	9	6	4	5	4	8	8	7	4	11	5	7	9	12	8 :	117 24.
LT 3 :	1	2	3	1	1	1	1	3	2	1	2	1	0	1	3	2 :	25 5.
TOTAL :	15	12	9	5	6	5	10	27	63	147	68	7	9	25	40	34 :	482
PERCENT :	3.	2.	2.	1.	1.	1.	2.	6.	13.	30.	14.	1.	2.	5.	8.	7.	100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 10 0.21 %

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 100 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - E

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION								NNW	NW	TOTAL	%
	12	7	10	11	10	10	12	17	S	SSW	SW	WSW	W	WNW	15	21	19			
61 - 24	:							6	3	1	1								11	1.
18 - 24	:							19	44	28	1	0				8	3		103	9.
12 - 18	:	1					1	72	89	121	38	3	0	11		24	18		378	31.
7 - 12	:	6	2	4	4	13	27	22	41	56	12	6	1	17	16	16	15		260	22.
3 - 7	:	19	7	23	16	27	45	20	23	20	8	14	16	10	14	14	7		302	25.
LT 3	:	6	8	9	9	10	21	23	3	2	4	0	3	5	4	4	12		152	13.
TOTAL	:	32	17	36	29	50	84	137	175	249	93	25	21	43	66	66	55		1206	
PERCENT	:	3.	1.	3.	2.	4.	7.	11.	15.	21.	8.	2.	2.	4.	5.	5.	5.		100.	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 5(0.41 %)

STABILITY WIND ROSE DIAGRAM

C-H SHALE OIL PROJECT

LEVEL = 100 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - TOTAL

GROUP MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION					WSW	W	WNW	NW	NNW	TOTAL	%
									S	SSW	SW	WSW								
GT 24 :	13	8	10	11	10	10	12	17	1	13	5	1	1						21	1.
18 - 24 :									27	73	47	2	0			8	4		161	8.
12 - 18 :	3						1	78	117	211	81	4	1	20	34	29			579	29.
7 - 12 :	10	3	4	4	13	18	30	35	65	98	34	8	5	31	44	31			433	22.
3 - 7 :	41	25	41	29	35	52	44	37	41	37	31	22	26	29	42	27			559	28.
LT 3 :	12	13	21	18	19	23	38	37	11	9	9	4	9	9	11	15			258	13.
TOTAL :	66	41	66	51	67	93	113	187	262	441	207	41	42	89	139	106			2011	
PERCENT :	3.	2.	3.	3.	3.	5.	6.	9.	13.	22.	10.	2.	2.	4.	7.	5.			100	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 60 0.30 %)

PERCENTAGE OF A STABILITY - 4.82 %
 PERCENTAGE OF B STABILITY - 1.74 %
 PERCENTAGE OF C STABILITY - 9.50 %
 PERCENTAGE OF D STABILITY - 23.97 %
 PERCENTAGE OF E STABILITY - 59.97 %

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 200 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - A

GROUP	MAX SPEED MPH	WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NNW	NW		
GT	24	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	0
18 -	24	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	0
12 -	18	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	0
7 -	12	1	:	:	:	:	:	:	:	:	1	:	:	:	1	:	:	2	1
3 -	7	9	8	5	5	1	2	6	3	17	15	7	5	9	7	4	2	5	23
LT	3	6	9	12	10	4	12	10	11	7	5	10	3	5	6	9	8	10	117
TOTAL		16	17	17	15	5	14	16	14	24	27	17	10	17	18	19	24	270	43
PERCENT		6.	6.	6.	6.	2.	5.	6.	5.	9.	10.	6.	4.	6.	7.	7.	9.	9.	100

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 22(8.15 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT

LEVEL =200 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - B

GROUP MAX SPEED MPH	STABILITY CLASS	WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
18 - 24	:	12	4	5	4	7	6	7	8	11	9	11	9	8	12	9	11		0.
12 - 18	:																		0.
7 - 12	:	1				1		1	2	2	1	3	2	3	0	4	3	23	14.
3 - 7	:	8	2	3	5	3	3	4	7	5	9	1	4	3	5	4	12	78	46.
LT 3	:	3	4	4	5	4	1	6	5	10	5	2	2	1	6	6	2	66	39.
TOTAL	:	13	6	7	10	8	4	11	14	17	15	6	8	7	12	14	17	169	
PERCENT	:	8.	4.	4.	6.	5.	2.	7.	8.	10.	9.	4.	5.	4.	7.	8.	10.	100.	

..... TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE = 8(4.73 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 200 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - C

GROUP	MAX SPEED MPH	WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
GT	24	15	10	7	6	8	7	8	10	9	17	27	25	15	20	14	20	2	0.
18 -	24											8	1		1		2	12	2.
12 -	18										8	13	2	4	6	9	10	56	11.
7 -	12	11	5	1		3	4	2	3	5	17	19	7	8	13	27	23	148	28.
3 -	7	17	13	6	8	9	3	5	17	27	21	13	4	12	14	18	20	207	39.
LT	3	3	6	5	7	5	10	7	16	11	5	7	5	8	5	3	5	108	20.
TOTAL		35	24	12	15	17	17	14	36	43	51	61	20	32	39	57	60	533	
PERCENT		7.	5.	2.	3.	3.	3.	3.	7.	8.	10.	11.	4.	6.	7.	11.	11.	100.	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 11(2.06 %)

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 200 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - D

GROUP	MAX SPEED KPH	WIND DIRECTION																TOTAL	%
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		
GT	24	:	:	:	:	:	:	:	:	1	6	12	:	:	:	:	1	:	20
18 -	24	:	1	2	:	:	:	:	:	5	23	47	8	3	:	2	4	:	95
12 -	18	:	7	4	1	:	:	:	4	16	75	82	24	5	20	18	26	:	282
7 -	12	:	15	6	4	3	2	6	6	17	54	42	21	23	29	42	45	:	321
3 -	7	:	14	17	22	17	12	16	27	37	56	26	13	15	29	25	21	:	373
LT	3	:	7	10	7	3	10	8	5	26	24	11	13	7	10	9	8	:	166
TOTAL	:	44	39	34	23	24	24	30	41	41	102	238	220	79	53	88	105	:	1257
PERCENT	:	4.	3.	3.	2.	2.	2.	3.	3.	8.	19.	18.	6.	4.	7.	8.	8.	:	100.

.....
TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 170 1.35 %

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL = 200 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - F

GROUP	MAX SPEED MPH	N	NNE	NE	ENE	E	ESE	SE	SSE	WIND DIRECTION								NNW	NW	TOTAL	%
										S	SSW	SW	WSW	W	WNW	NW	NNW				
61	24	:							1	1	9	14				1	4	:	30	1	
18	24	:	6	9					4	21	51	53	13	3		7	8	:	175	7	
12	18	:	20	4			6		19	115	181	106	29	9	21	32	49	:	591	22	
7	12	:	38	5	4	1	31	83	64	60	122	81	23	36	45	59	64	:	749	28	
3	7	:	37	14	27	18	25	120	73	113	83	55	35	18	26	24	35	:	768	29	
LY	3	:	16	11	10	11	31	45	32	40	42	27	17	13	21	23	22	:	373	14	
TOTAL		:	117	43	41	30	127	254	193	370	488	336	117	79	113	146	182	:	2686		
PERCENT		:	4.	2.	2.	1.	5.	9.	7.	14.	18.	13.	4.	3.	4.	5.	7.	:	100		

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 46(1.71 %)

STABILITY WIND ROSE DIAGRAM

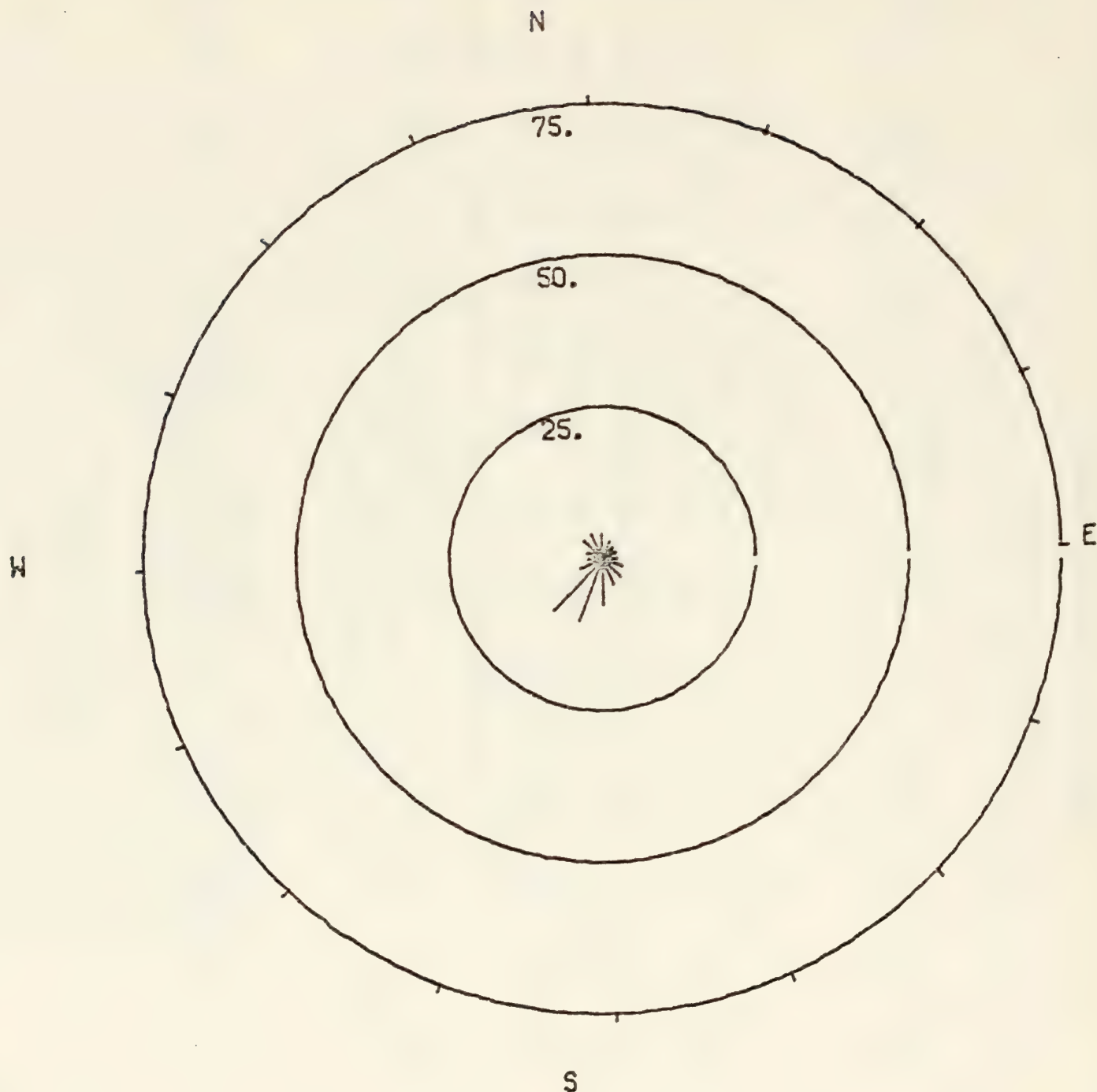
C-B SHALE OIL PROJECT
LEVEL = 200 FEET PERIOD(8/ 1/77 TO 8/31/77)

STABILITY CLASS - TOTAL

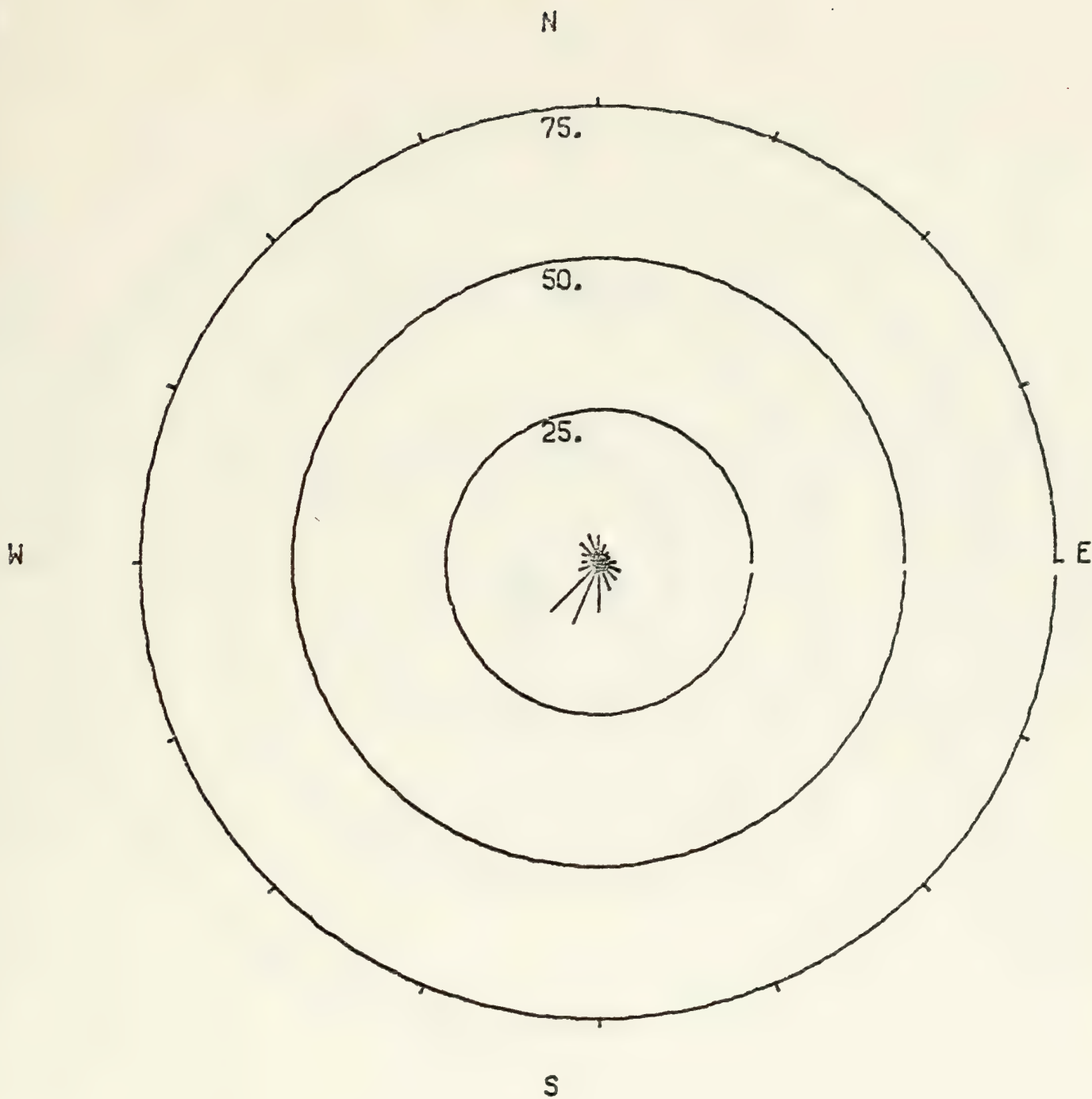
GROUP MAX SPEED KPH	N	NNE	NE	ENE	E	ESE	SE	WIND DIRECTION								NW	NNW	TOTAL	%
								SSE	S	SSW	SW	WSW	W	WNW					
GT 24 :	22	21	12	9	10	11	14	24	27	31	33	25	23	20		1	5	52	1.
18 - 24 :	7	11						4	26	74	108	22	6	1		9	14	282	6.
12 - 18 :	32	8	1				6	23	131	265	201	55	18	49		59	85	933	19.
7 - 12 :	66	16	9	4	19	41	92	75	104	200	145	55	73	91		134	140	1264	26.
3 - 7 :	85	54	63	53	50	89	162	126	199	184	102	61	57	81		79	98	1543	31.
LT 3 :	37	42	40	37	37	64	78	71	96	84	58	42	35	50		52	49	872	18.
TOTAL :	227	131	113	94	106	194	338	300	558	822	641	236	189	272		334	391	4946	
PERCENT :	5.	5.	2.	2.	2.	4.	7.	6.	11.	17.	13.	5.	4.	5.		7.	8.	100.	

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 1040 (2.10 %)

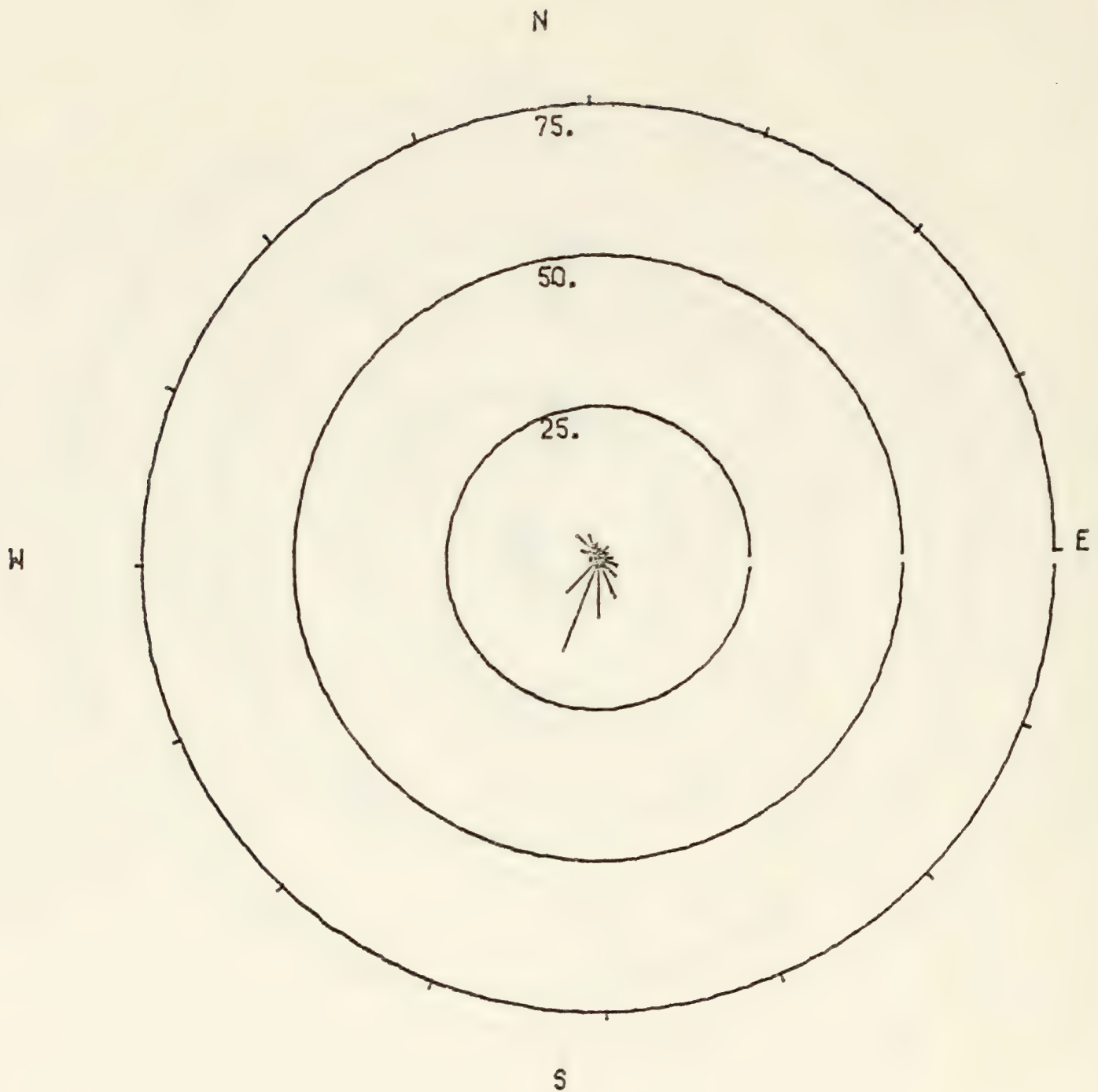
PERCENTAGE OF A	STABILITY -	5.46 %
PERCENTAGE OF B	STABILITY -	3.42 %
PERCENTAGE OF C	STABILITY -	10.78 %
PERCENTAGE OF D	STABILITY -	25.41 %
PERCENTAGE OF E	STABILITY -	54.31 %



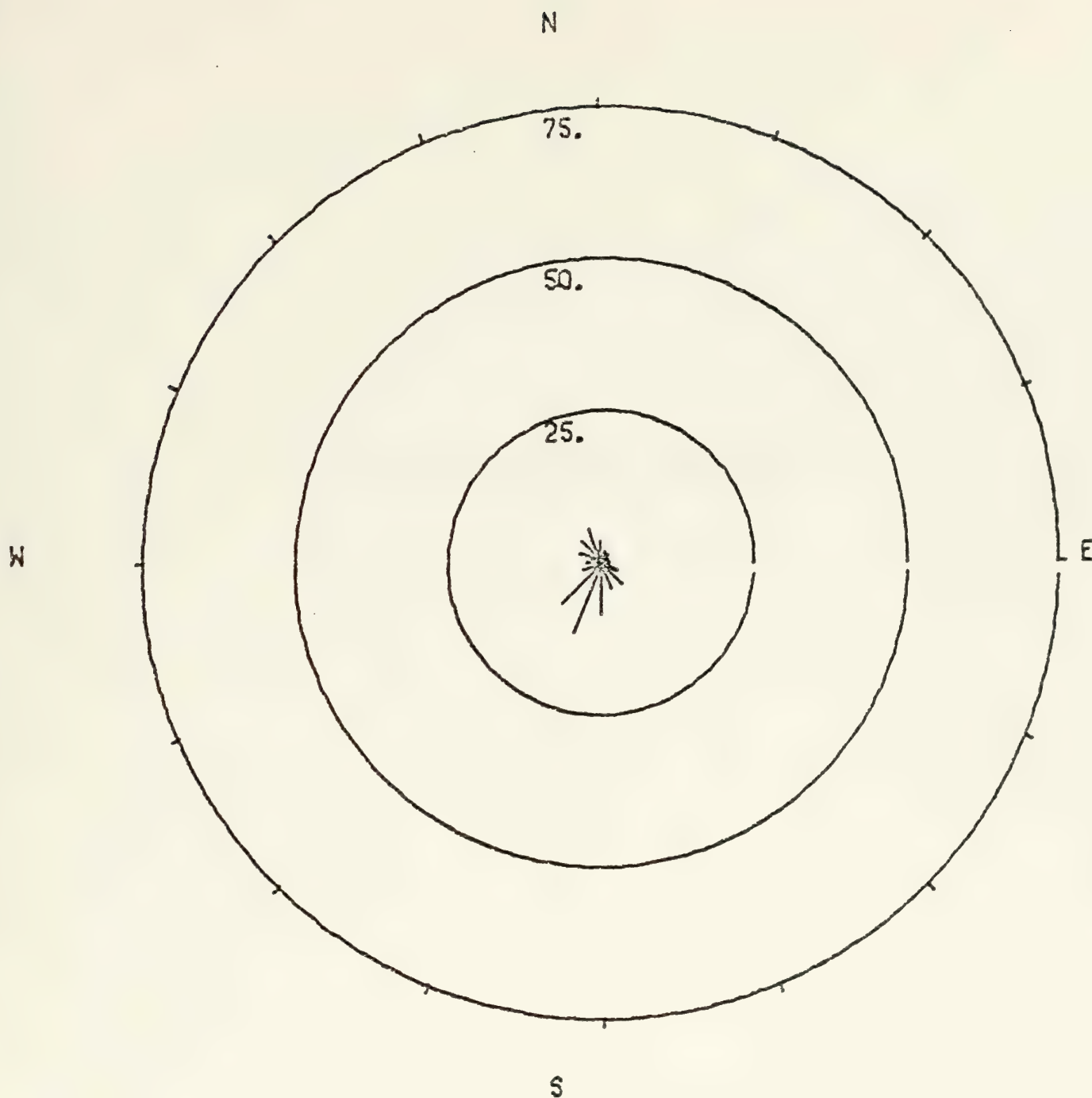
PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 8 FOOT LEVEL



PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 30 FOOT LEVEL



PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 100 FOOT LEVEL



PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 200 FOOT LEVEL

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INTERIM MONITORING REPORT RADIAN CORRECTIONS

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A. Air Quality Instrumentation

Nitrogen oxides are measured with a Meloy Model NA520 analyzer. This dual-channel analyzer is based on the chemiluminescent principle and continuously monitors both NO_x and NO . A subtraction circuit in the instrument provides a continuous NO_2 output, but is not used in Radian's system. NO_2 is calculated once a second by the computer by subtracting the NO value from the NO_x value, thus avoiding any drift which might occur in the NO_2 output of the instrument. This instrument has a minimum detectable sensitivity of 5 ppb (parts per billion) and a linearity of $\pm 1\%$.

Sulfur dioxide is measured with the Meloy SA185-2A analyzer while hydrogen sulfide is measured with the Meloy SA185-2 analyzer. The hydrogen sulfide analyzer uses a Meloy Model SO_2 -1 sulfur dioxide scrubber and the sulfur dioxide analyzer uses a Meloy Model H_2S -1 hydrogen sulfide scrubber. The Model SA185-2 is a continuous analyzer and utilizes the flame photometric principle of operation. The minimum detectable sensitivity for the Model SA185-2 is 5 ppb with a linearity of $\pm 1\%$ and the minimum detectable sensitivity for the Model SA185-2A is 2 ppb with a linearity of $\pm 1\%$.

Ozone is measured with a Meloy Model OA350 analyzer. This instrument, based on the chemiluminescent principle, provides continuous measurement of ozone. The minimum detectable sensitivity is 0.5 ppb and the linearity is $\pm 1\%$.

Total hydrocarbons, methane, and carbon monoxide are monitored with a Bendix Model 8200 gas chromatograph analyzer. This instrument, which uses a plume ionization detector, has a minimum detectable sensitivity of 5 ppb for all three components. The Model 8200 works on a five-minute cycle, i.e., one air sample is analyzed every five minutes, and the results are displayed for five minutes via a sample and hold circuit.

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RADIAN

CORPORATION

DCN 77-100-152-03

AIR MONITORING REPORT
FOR
C-b SHALE OIL PROJECT
APRIL 1977
REPORT NO. 32
REVISED

19 October 1977

Presented to:
C-b Shale Oil Project
United Bank Tower
Denver, Colorado 80202

Prepared by:
Radian Staff

Note: Only revised page changes from
original report are included
here.

II B-1315

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TABLE III
AVERAGES FOR APRIL 1 THRU 30

TABLE III. AVERAGES FOR APR 1 THRU 30

(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITROGEN OXIDES(NOX) NITRIC OXIDE(NO) NITROGEN DIOXIDE(NO2)

SITE 023 023 023
2.5 1.3 1.1

SULFUR DIOXIDE(SO2) PYRANOMETER SULFUR DIOXIDE(SO2)

SITE 023 12864.5 023
.1 .4

TOTAL HYDROCARBONS

METHANE

NON-METHANE HYDROCARBONS

SITE 023 023 023
1203.5 911.0 292.3

CARBON MONOXIDE

OZONE

BAROMETRIC PRESSURE

SITE 023 023 023
.04 80.5 789.3

TOTAL PRECIPITATION

PARTICULATE

SITE 023 023
.04 5.4

TABLE IV. DAILY AVERAGES FOR APR 1 THRU 30

(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITROGEN OXIDES(NOX)

NITRIC OXIDE(NO)

NITROGEN DIOXIDE(NO2)

SITE 023

023

023

DATE

4/ 1	.3	.0	.3
4/ 2	.8	.2	.7
4/ 3	.1	.1	.1
4/ 4	.1	.1	.0
4/ 5	1.4	.1	1.3
4/ 6	2.8	.1	2.8
4/ 7	.6	.6	.0
4/ 8	.6	.6	.0
4/ 9	.1	.0	.0
4/10	.0	.0	.0
4/11	1.3	1.2	.1
4/12	1.6	1.4	.1
4/13	.5	.5	.1
4/14	.1	.1	.0
4/15	5.6	5.5	.1
4/16	8.5	8.3	.2
4/17	4.7	4.0	.7
4/18	2.6	1.4	1.3
4/19	2.9	1.8	1.1
4/20	2.1	.6	1.5
4/21	5.0	.3	4.7
4/22	1.2	.0	1.2
4/23	1.3	.0	1.3
4/24	.9	.0	.9
4/25	3.3	2.7	.6
4/26	12.5	.0	12.5
4/27	2.4	.4	2.0
4/28	9.0	7.6	1.4
4/29	2.2	1.8	.4
4/30	.0	.0	.0

TABLE IV. DAILY AVERAGES FOR APR. 1 THRU 30
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

DATE	SITE	SULFUR DIOXIDE(SO2)		PYRANOMETER		SULFUR DIOXIDE(SO2)	
		023	023	023	023	023	023
4/1	0	239.6				0	
4/2	0	197.3				1	
4/3	0	437.9				5	
4/4	0	449.0				9	
4/5	0	313.9				8	
4/6	0	576.5				0	
4/7	0	479.3				0	
4/8	0	580.0				0	
4/9	0	596.1				0	
4/10	0	599.2				0	
4/11	0	326.4				0	
4/12	0	166.5				2	
4/13	0	369.9				2.0	
4/14	0	570.3				3.2	
4/15	1	110.4				1.1	
4/16	0	410.8				0	
4/17	0	534.8				0	
4/18	0	481.5				0	
4/19	0	89.5				0	
4/20	0	467.8				3.3	
4/21	0	447.3				0	
4/22	1	593.7				1	
4/23	0	653.1				0	
4/24	1.1	595.8				0	
4/25	1	508.5				0	
4/26	0	420.1				0	
4/27	0	203.9				0	
4/28	0	311.2				0	
4/29	0	540.5				0	
4/30	0.4	592.8				0	

COMPANY V, MAXIMUM FIVE MINUTE AVERAGE, J AND TIME OF OCCURRENCE FOR APR 1 THR
 (UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
 TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
 PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

PYRANOMETER

SITE 023

DATE

4/1	5.15(10:20)
4/2	5.20(10:25)
4/3	7.10(10:55)
4/4	6.55(12:40)
4/5	7.70(11:50)
4/6	6.30(11:50)
4/7	7.35(12:40)
4/8	6.45(12:15)
4/9	6.55(12:15)
4/10	6.55(12:00)
4/11	7.55(11:40)
4/12	5.60(12:40)
4/13	7.85(12:30)
4/14	7.35(13:40)
4/15	1.90(13:55)
4/16	7.20(12:55)
4/17	6.55(12:00)
4/18	7.75(13:00)
4/19	1.55(10:40)
4/20	7.80(12:05)
4/21	6.65(12:30)
4/22	6.65(12:10)
4/23	6.90(12:05)
4/24	7.15(12:25)
4/25	7.15(13:35)
4/26	7.55(11:00)
4/27	4.90(14:30)
4/28	6.35(13:20)
4/29	7.40(12:15)
4/30	7.15(11:45)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR APR 1 THRU 30
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

SULFUR DIOXIDE(SO2)

DATE SITE 423

4/1	5.2(13:15)
4/2	2.6(22:20)
4/3	2.6(0:20)
4/4	15.6(14:45)
4/5	5.2(8:25)
4/6	2.6(17:00)
4/7	.0(0:00)
4/8	.0(0:00)
4/9	.0(0:00)
4/10	.0(0:00)
4/11	.0(0:00)
4/12	2.5(11:45)
4/13	10.4(23:25)
4/14	10.4(9:15)
4/15	5.2(0:15)
4/16	.0(0:30)
4/17	2.5(8:40)
4/18	2.6(8:20)
4/19	2.5(1:50)
4/20	25.4(10:35)
4/21	.0(0:40)
4/22	25.4(11:30)
4/23	.0(0:00)
4/24	.0(0:10)
4/25	.0(0:40)
4/26	.0(0:00)
4/27	.0(0:00)
4/28	.0(0:00)
4/29	.0(0:00)
4/30	.0(0:00)

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE(SO2) TRAILER NO. - 23 PERIOD(4/ 1/77 TO 4/30/77) C-B SHALE OIL PROJECT 4/30/77)

CONCENTRATION UG/M**3 GT		WIND DIRECTION															TOTAL		
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW		NNW	CALM
130 -	140 :																		:
120 -	130 :																		:
110 -	120 :																		:
100 -	110 :																		:
90 -	100 :																		:
80 -	90 :																		:
70 -	80 :																		:
60 -	70 :																		:
50 -	60 :																		:
40 -	50 :																		:
30 -	40 :																		:
20 -	30 :																		:
10 -	20 :																		:
LT	10 :	441	209	188	217	402	406	576	588	667	970	906	460	437	547	771	460	148	839
TOTAL	:	441	209	188	217	402	406	576	588	667	970	906	460	437	547	771	460	148	839
MEAN	:	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

II B

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE(SO2)

TRAILER NO. - 23 PERIOD(4/ 1/77 TO 4/30/77) C-B SHALE OIL PROJECT

WIND DIRECTION

	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
CONCENTRATION																		
UG/M*3																		
GT 140 :																		
130 - 140 :																		:
120 - 130 :																		:
110 - 120 :																		:
100 - 110 :																		:
90 - 100 :																		:
80 - 90 :																		:
70 - 80 :																		:
60 - 70 :																		:
50 - 60 :																		:
40 - 50 :																		:
30 - 40 :																		:
20 - 30 :																		:
10 - 20 :																		:
LT	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	431	207	188	217	402	406	576	588	668	970	906	460	437	547	767	430	149	8323
TOTAL	431	207	188	217	402	406	576	588	668	970	906	460	437	547	767	430	149	8323
MEAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

DIURNAL VARIATION OF SULFUR DIOXIDE (UG/M*3)
TRAILER NO. - 23 PERIOD (4/ 1/77 TO 4/30/77)

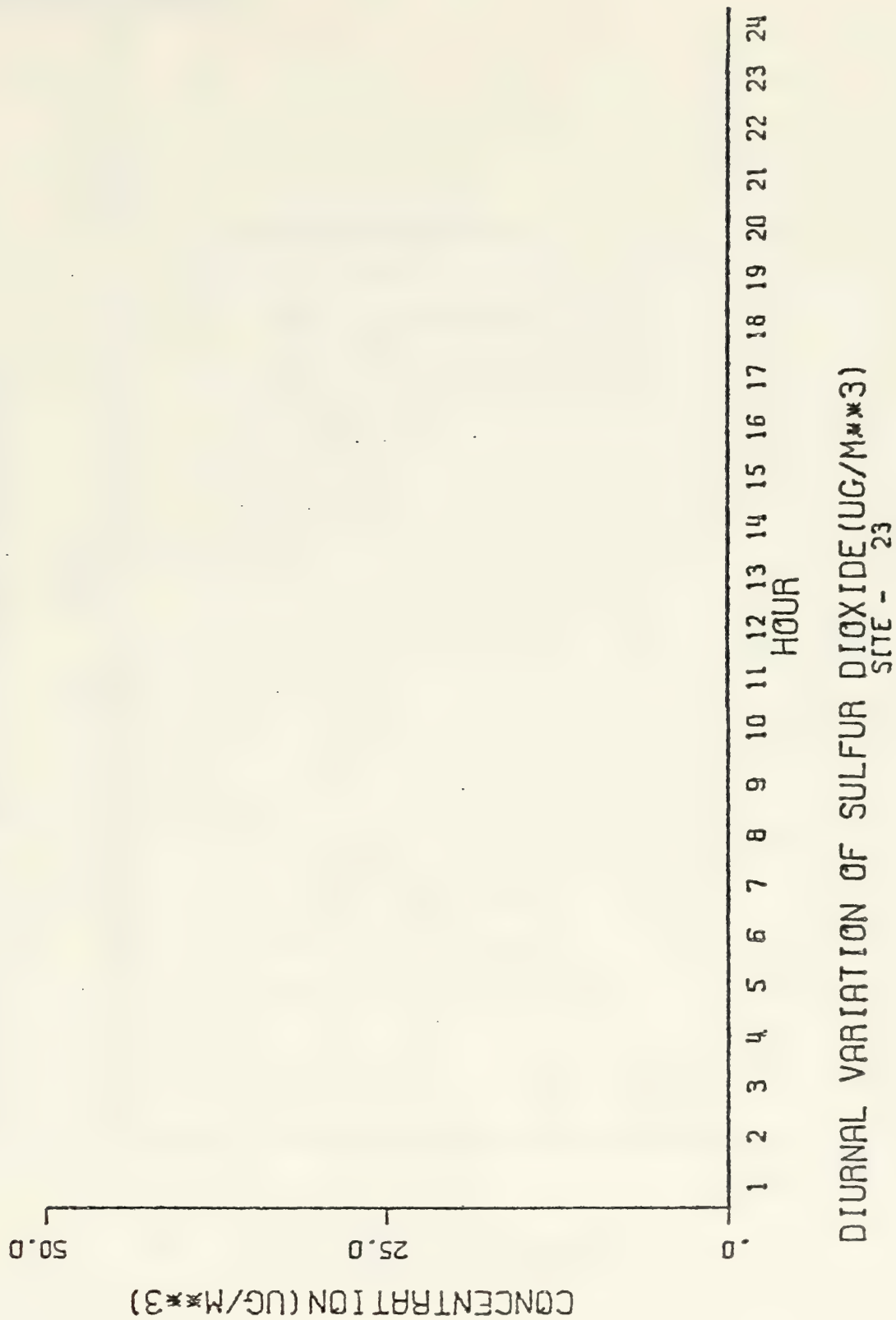
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
HOUR	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	1	2	2	3	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	2	1	2	2	1	0	1	2	2	1	0	0	0	0	1	0	0	0	0	0	0	1	2	2	0
5	2	1	2	2	2	0	1	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

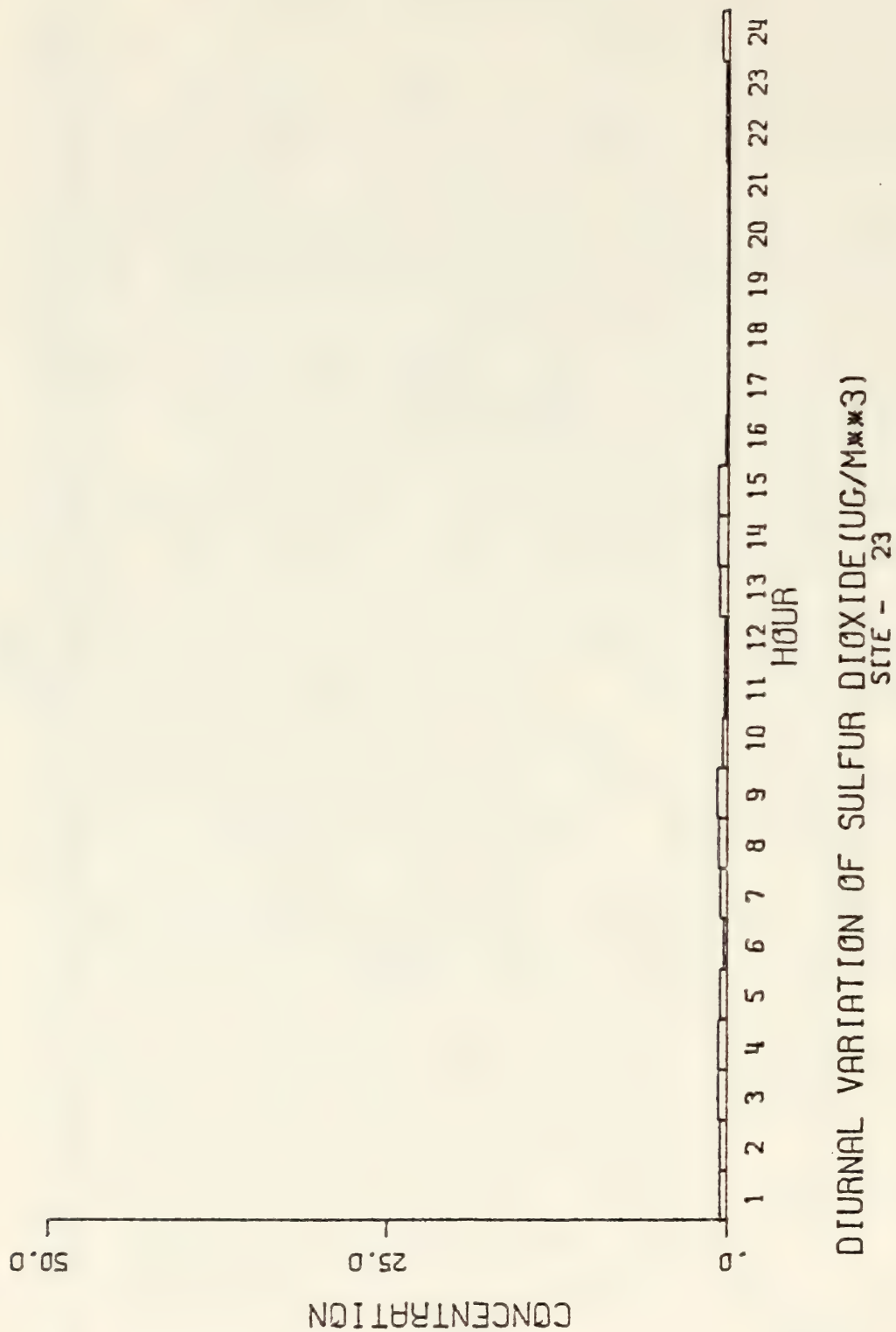
TOTAL NUMBER OF OBSERVATIONS = 8358. MEAN = 0.

: INDICATES CALIBRATION DURING THE HOUR

TOTAL NUMBER OF OBSERVATIONS = 7911 MEAN = 120.

•: INDICATES CALIBRATION DURING THE HOUR





RADIAN

CORPORATION

DCN 77-100-152-04

AIR MONITORING REPORT
FOR
C-b SHALE OIL PROJECT
MAY 1977
Report No. 33
REVISED

19 October 1977

Presented to:
C-b Shale Oil Project
United Bank Tower
Denver, Colorado 80202

Prepared by:
Radian Staff

Note: Only revised page changes from
original report are included
here.

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	Methane-----	-1590
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Total Hydrocarbons-----	-1615
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I. GENERAL DESCRIPTION OF AIR MONITORING PROGRAM

Radian Corporation, under contract to the C-b Oil Shale Project, is performing the data compilation and reporting of air quality and meteorological data at one monitoring site in Northwest Colorado. The site measures and records concentrations of particulates, sulfur dioxide, oxides of nitrogen, hydrogen sulfide, total hydrocarbons, methane, and carbon monoxide. A 200-foot meteorological tower provides wind direction, wind speed, temperature, and relative humidity data at four levels (8, 30, 100, and 200 feet). Other meteorological variables measured at the tower site are insolation, barometric pressure, and precipitation.

Figure I shows the configuration of the monitoring station. The station provides a sturdy and protective covering for the monitoring equipment.

TABLE III. AVERAGES FOR MAY 1 THRU 31

(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITROGEN OXIDES(NOx) NITRIC OXIDE(NO) NITROGEN DIOXIDE(NO2)

SITE 023 023 023
.1 .1 .0

SULFUR DIOXIDE(SO2) PYRANOMETER SULFUR DIOXIDE(SO2)

SITE 023 023 023
.1 16221.1 .8

TOTAL HYDROCARBONS METHANE NON-METHANE HYDROCARBONS

SITE 023 023 023
1145.8 921.3 184.1

CARBON MONOXIDE OZONE BAROMETRIC PRESSURE

SITE 023 023 023
437.4 95.3 786.1

TOTAL PRECIPITATION PARTICULATE

SITE 023 023
.36 18.2

TABLE III. AVERAGES FOR MAY 1 THRU 31

(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

WIND SPEED

SITE 023	(8-FT)	(30-FT)	(100-FT)	(200-FT)
	5.2	6.9	7.9	8.7

WIND DIRECTION

SITE 023	(8-FT)	(30-FT)	(100-FT)	(200-FT)
	207.4	200.8	199.2	208.5

RELATIVE HUMIDITY

SITE 023	(8-FT)	(30-FT)	(100-FT)	(200-FT)

TEMPERATURE

SITE 023	(8-FT)	(30-FT)	(100-FT)	(200-FT)
	47.8	49.4	48.7	48.2

(UNITS; CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TEMPERATURE

SITE 023		(8-FT)	(30-FT)	(100-FT)	(200-FT)
DATE					
5/ 1	49.4	51.5	50.9	50.9	50.7
5/ 2	49.6	52.0	51.5	51.5	51.3
5/ 3	49.2	51.2	50.7	50.7	50.3
5/ 4	45.4	46.8	45.9	45.9	45.3
5/ 5	48.7	50.3	49.2	49.2	48.6
5/ 6	52.8	54.3	53.3	53.3	52.9
5/ 7	54.3	57.1	56.6	56.6	56.1
5/ 8	54.1	57.0	57.1	57.1	57.1
5/ 9	59.1	61.6	61.1	61.1	60.9
5/10	42.5	44.0	43.5	43.5	42.8
5/11	46.9	49.6	49.5	49.5	49.2
5/12	53.0	55.1	54.4	54.4	54.1
5/13	48.5	50.6	49.9	49.9	49.1
5/14	37.7	38.8	38.0	38.0	36.8
5/15	42.6	43.6	42.7	42.7	41.7
5/16	46.7	48.4	47.3	47.3	46.6
5/17		44.1	43.1	43.1	42.2
5/18	40.8	40.2	39.2	39.2	38.6
5/19					
5/20					
5/21					
5/22					
5/23					
5/24					
5/25					
5/26					
5/27					
5/28					
5/29					
5/30					
5/31					

TABLE IV. DAILY AVERAGES FOR MAY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

RELATIVE HUMIDITY

SITE 023			
DATE	(8-FT)	(30-FT)	(100-FT)
			(200-FT)
5/ 1			
5/ 2			
5/ 3			
5/ 4			
5/ 5			
5/ 6			
5/ 7			
5/ 8			
5/ 9			
5/10			
5/11			
5/12			
5/13			
5/14			
5/15			
5/16			
5/17			
5/18			
5/19			
5/20			
5/21			
5/22			
5/23			
5/24			
5/25			
5/26			
5/27			
5/28			
5/29			
5/30			
5/31			

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TABLE V
MAXIMUM FIVE-MINUTE AVERAGES AND TIME OF
OCCURRENCE FOR MAY 1 THRU 31

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR MAY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

PYRANOMETER

SITE 023

DATE

5/1	6.35(14:25)
5/2	6.85(11:55)
5/3	7.25(14:05)
5/4	7.85(12:45)
5/5	7.10(11:40)
5/6	7.25(12:50)
5/7	6.75(11:30)
5/8	6.75(11:20)
5/9	7.00(11:50)
5/10	8.45(13:00)
5/11	6.90(11:30)
5/12	7.25(13:45)
5/13	7.20(10:40)
5/14	5.20(13:15)
5/15	7.90(13:45)
5/16	6.95(11:45)
5/17	7.05(12:00)
5/18	7.25(11:35)
5/19	8.05(12:30)
5/20	7.85(10:45)
5/21	8.60(11:25)
5/22	8.00(12:50)
5/23	7.80(12:15)
5/24	7.40(11:20)
5/25	7.65(11:10)
5/26	8.15(13:30)
5/27	8.05(11:55)
5/28	7.55(12:15)
5/29	8.05(12:00)
5/30	7.00(11:50)
5/31	6.95(11:45)

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR MAY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

SULFUR DIOXIDE(SO2)

DATE	SITE	023
5/1	2.6(8:35)	
5/2	5.2(22:15)	
5/3	5.2(0:00)	
5/4	7.8(12:45)	
5/5	19.4(9:25)	
5/6	5.2(1:50)	
5/7	5.2(0:40)	
5/8	2.6(1:30)	
5/9	2.6(1:30)	
5/10	2.6(0:50)	
5/11	2.6(3:35)	
5/12	2.6(3:30)	
5/13	2.6(3:25)	
5/14	5.2(3:25)	
5/15	5.2(3:25)	
5/16	15.6(15:20)	
5/17	15.6(0:10)	
5/18	5.2(3:25)	
5/19	2.6(3:25)	
5/20	2.6(0:55)	
5/21	2.6(0:50)	
5/22	5.2(3:30)	
5/23	7.8(22:25)	
5/24	7.8(0:25)	
5/25	7.8(0:20)	
5/26	5.2(14:25)	
5/27	2.6(3:25)	
5/28	2.6(24:50)	
5/29	5.2(2:50)	
5/30	2.6(3:25)	
5/31	5.2(3:25)	

WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PRECIPITATION-INCHES

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR MAY 1 THRU 31
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TEMPERATURE

SITE 023		(8-FT)			(30-FT)			(100-FT)			(200-FT)			
DATE	(8-FT)	(30-FT)	(100-FT)	(200-FT)	DATE	(8-FT)	(30-FT)	(100-FT)	(200-FT)	DATE	(8-FT)	(30-FT)	(100-FT)	(200-FT)
5/ 1	58.0(8:45)	58.0(0:00)	60.0(0:00)	60.0(0:00)	5/11	64.0(13:30)	64.0(15:15)	62.0(15:15)	61.0(14:55)	5/21	53.0(10:40)	52.0(14:55)	51.0(14:55)	50.0(10:10)
5/ 2	65.0(13:15)	63.0(14:55)	61.0(14:55)	62.0(16:30)	5/12	67.0(14:25)	66.0(13:55)	64.0(13:55)	63.0(14:25)	5/22	62.0(15:35)	60.0(14:30)	57.0(14:05)	56.0(14:30)
5/ 3	59.0(10:00)	59.0(10:10)	57.0(10:10)	57.0(10:25)	5/13	63.0(15:05)	63.0(15:15)	61.0(15:15)	60.0(15:15)	5/23	61.0(14:35)	50.0(15:10)	48.0(15:10)	46.0(11:40)
5/ 4	58.0(14:45)	57.0(16:35)	55.0(16:35)	55.0(15:45)	5/14	44.0(15:50)	43.0(13:20)	42.0(13:30)	42.0(13:30)	5/24	53.0(10:40)	49.0(11:40)	47.0(11:40)	46.0(11:40)
5/ 5	64.0(14:05)	62.0(15:35)	60.0(16:10)	60.0(16:00)	5/15	53.0(10:40)	52.0(14:55)	51.0(14:55)	50.0(10:10)	5/25	62.0(15:35)	60.0(14:00)	58.0(15:00)	57.0(14:05)
5/ 6	66.0(15:05)	63.0(15:00)	61.0(15:00)	61.0(15:05)	5/16	62.0(15:35)	60.0(14:00)	58.0(15:00)	57.0(14:05)	5/26	61.0(14:35)	56.0(14:30)	56.0(14:30)	56.0(14:30)
5/ 7	69.0(13:05)	69.0(14:45)	67.0(15:15)	67.0(15:20)	5/17	61.0(14:35)	58.0(14:30)	56.0(14:30)	56.0(14:30)	5/27	53.0(15:10)	48.0(15:10)	48.0(15:10)	48.0(14:05)
5/ 8	70.0(14:25)	69.0(15:00)	67.0(15:00)	68.0(16:05)	5/18	53.0(15:10)	50.0(15:10)	48.0(15:10)	48.0(14:05)	5/28	50.0(10:40)	49.0(11:40)	47.0(11:40)	46.0(11:40)
5/ 9	73.0(15:10)	73.0(17:05)	71.0(17:05)	70.0(17:05)	5/19	50.0(10:40)	49.0(11:40)	47.0(11:40)	46.0(11:40)	5/29				
5/10	53.0(0:00)	56.0(0:00)	55.0(0:00)	54.0(0:00)	5/20					5/30				
5/11	64.0(13:30)	64.0(15:15)	62.0(15:15)	61.0(14:55)						5/31				
5/12	67.0(14:25)	66.0(13:55)	64.0(13:55)	63.0(14:25)										
5/13	63.0(15:05)	63.0(15:15)	61.0(15:15)	60.0(15:15)										
5/14	44.0(15:50)	43.0(13:20)	42.0(13:30)	42.0(13:30)										
5/15	53.0(10:40)	52.0(14:55)	51.0(14:55)	50.0(10:10)										
5/16	62.0(15:35)	60.0(14:00)	58.0(15:00)	57.0(14:05)										
5/17	61.0(14:35)	58.0(14:30)	56.0(14:30)	56.0(14:30)										
5/18	53.0(15:10)	50.0(15:10)	48.0(15:10)	48.0(14:05)										
5/19	50.0(10:40)	49.0(11:40)	47.0(11:40)	46.0(11:40)										
5/20														
5/21														
5/22														
5/23														
5/24														
5/25														
5/26														
5/27														
5/28														
5/29														
5/30														
5/31														

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR MAY 1 THRU 31
 (UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
 TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
 BAROMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

RELATIVE HUMIDITY

DATE	SITE 423	
	(0-FT)	(30-FT)
5/1		(100-FT)
5/2		(200-FT)
5/3		
5/4		
5/5		
5/6		
5/7		
5/8		
5/9		
5/10		
5/11		
5/12		
5/13		
5/14		
5/15		
5/16		
5/17		
5/18		
5/19		
5/20		
5/21		
5/22		
5/23		
5/24		
5/25		
5/26		
5/27		
5/28		
5/29		
5/30		
5/31		

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TABLE VI
THE FIVE MAXIMUM INDEPENDENT SLIDING
AVERAGES FOR MAY 1 THRU 31

TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR MAY 1-31
(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)

UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

**SULFUR DIOXIDE (WS: WD)
1-HOUR**

023

SITE

1. 5/16(15:35-16:35) 15.2(27:189)
2. 5/16(16:40-17:40) 11.5(26:191)
3. 5/17(1:55-2:55) 10.9(3:30)
4. 5/19(23:35-2:35) 10.4(5:353)
5. 5/16(23:15-2:15) 7.8(12:234)

**TOTAL HYDROCARBONS (WS: WD)
3-HOUR (6-9AM)**

023

SITE

1. 5/23(6:00- 9:00)1364.3(13:156)
2. 5/20(6:00- 9:00)1229.3(2:295)
3. 5/22(6:00- 9:00)1131.0(5: 11)
4. 5/21(6:00- 9:00)1121.5(4:349)
5. 5/11(6:00- 9:00)1112.5(7:116)

TABLE VI. THE FIVE MAXIMUM AVERAGES FOR MAY 1-31
(WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

METHANE (WS: WD)
3-HOUR (6-9AM)

SITE 023

1.	5/20(	6:00-	9:00)	981.71	2:2951
2.	5/11(	6:00-	9:00)	932.71	7:1161
3.	5/21(	6:00-	9:00)	932.31	4:3491
4.	5/17(	6:00-	9:00)	927.81	12:2011
5.	5/18(	6:00-	9:00)	925.31	14:1771

PRIMARY STANDARD EXCEEDED 19 TIMES AT SITE 023

SECONDARY STANDARD EXCEEDED 19 TIMES AT SITE 023

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

SULFUR DIOXIDE (SO2) TRAILER NO. - 23 PERIOD(5/ 1/77 TO 5/31/77) C-8 SHALE OIL PROJECT

CONCENTRATION US/M**3 GT 140 :	WIND DIRECTION										NW	NNW	CALM	TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW
134 - 140 :														
124 - 130 :														
114 - 120 :														
104 - 110 :														
94 - 100 :														
84 - 90 :														
74 - 80 :														
64 - 70 :														
54 - 60 :														
44 - 50 :														
34 - 40 :														
24 - 30 :														
14 - 20 :	9	2	5	2				1	23	10	1	2	6	12
LT 14 :	250	142	180	170	166	174	391	847	1407	1830	1117	333	255	328
TOTAL :	259	144	180	172	148	174	391	848	1430	1840	1118	333	257	334
MEAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

C-B SHALE OIL PROJECT
 TRAILER NO. - 23 PERIOD(5/ 1/77 TO 5/31/77)

TOTAL HYDROCARBONS

CONCENTRATION UG/M**3 GT 4000 :		WIND DIRECTION																TOTAL	
		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		CALM
3600 - 4000 :								3		1									:
3400 - 3600 :								0		0									:
3200 - 3400 :								0	2	0									:
3000 - 3200 :								1	2	3				1					:
2800 - 3000 :								0	0	0				0					:
2600 - 2800 :								0	3	1				0					:
2400 - 2600 :								1	0	0	1			0					:
2200 - 2400 :								0	3	1				0					:
2000 - 2200 :								0	3	1				0					:
1800 - 2000 :								1	0	0	1			0					:
1600 - 1800 :								0	3	1	0			0					:
LT 1600 :	137	77	111	118	93	115	249	570	1093	1418	848	236	184	214	255	178	86	1	5991
TOTAL :	137	77	111	118	93	115	249	584	1103	1424	849	236	185	214	255	178	86	1	6014
.....																			
MEAN/100	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.	11.

DIURNAL VARIATION OF SULFUR DIOXIDE (UG/M**3)
TRAILER NO. - 23 PERIOD(5/ 1/77 TO 5/31/77)

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	ME
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL NUMBER OF OBSERVATIONS = 8611. MEAN = 0.

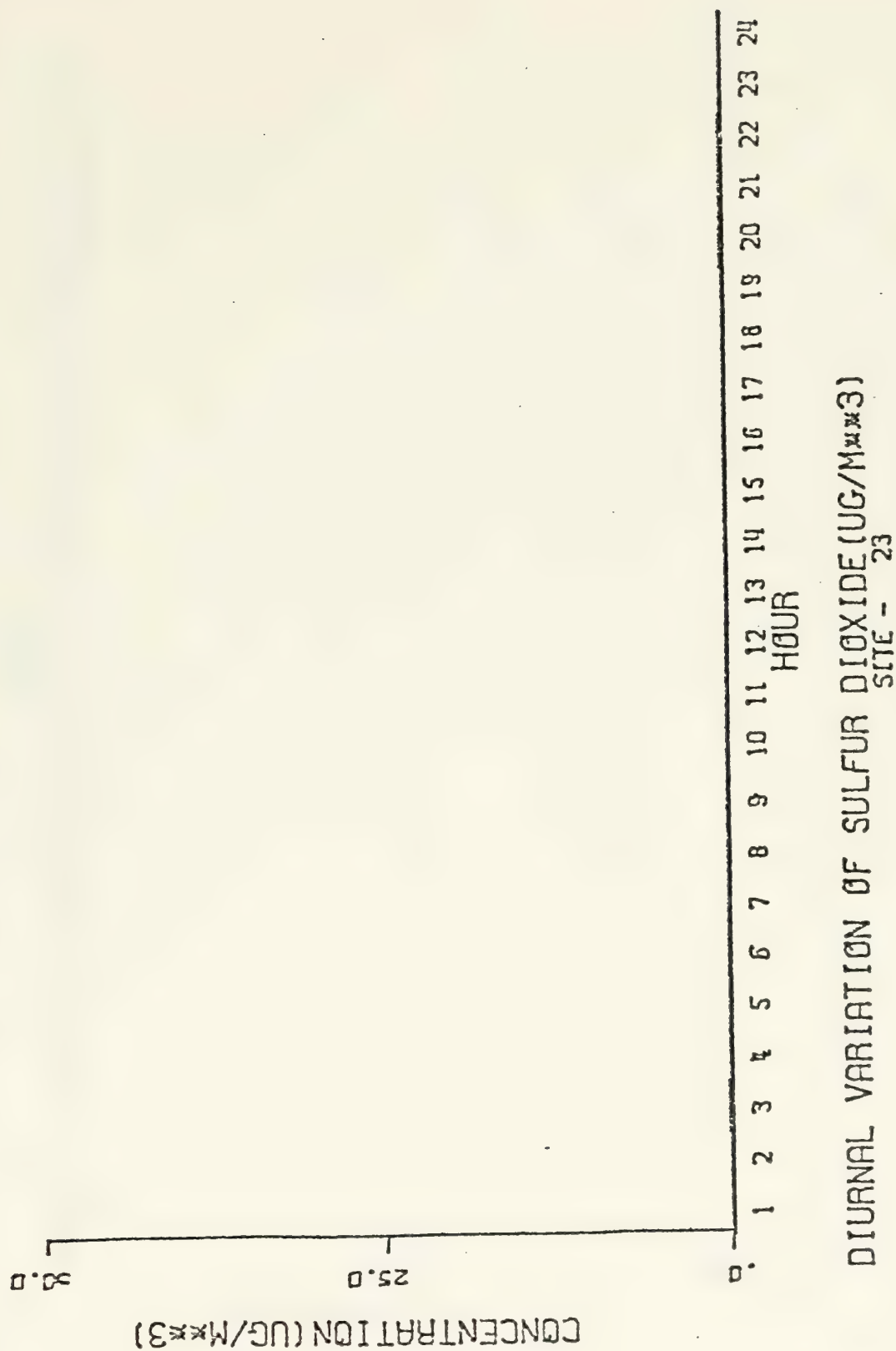
: INDICATES CALIBRATION DURING THE HOUR

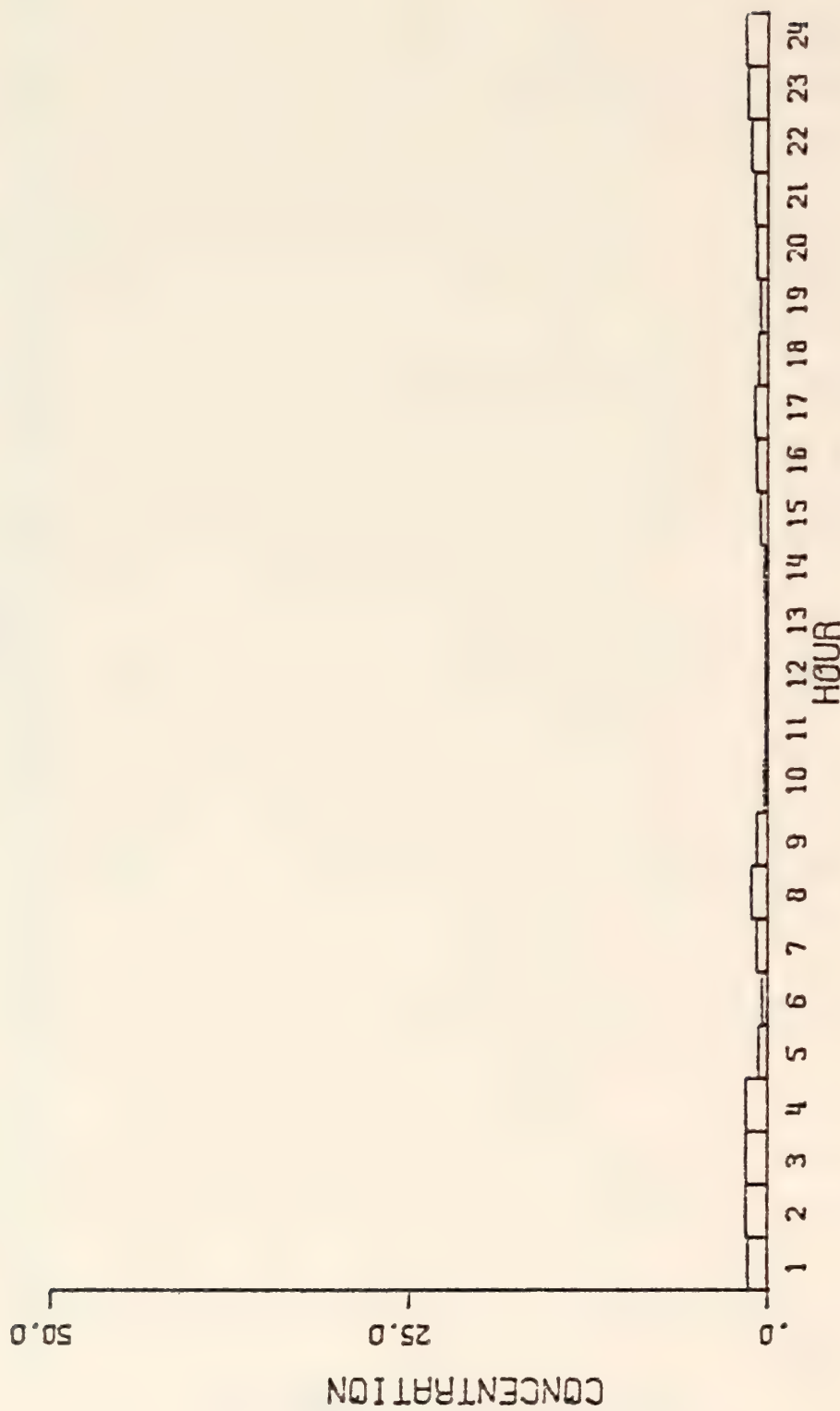
DAILY VARIATION OF SULFUR DIOXIDE (UG/M**3)
TRAILER NO. - 23 PERIOD (5/ 1/77 TO 5/31/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	0	2	0	0	0	0	0	0	0	0	0	1	0	0	2	0	1	0	0	0	0	1	0	0	0
2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
3	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	5	0	0
5	5	5	5	6	4	4	6	6	5	2	0	0	0	0	0	0	2	0	0	1	1	2	2	3	0
6	3	2	2	2	1	0	0	1	0	1	0	0	0	0	2	0	0	0	0	0	3	4	0	0	0
7	3	4	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEAN	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

TOTAL NUMBER OF OBSERVATIONS = 8609. MEAN = 1.

: INDICATES CALIBRATION DURING THE HOUR





DIURNAL VARIATION OF SULFUR DIOXIDE (UG/M³)
SITE - 23

CORRECTIONS TO
C-b FINAL ENVIRONMENTAL
BASELINE REPORT
VOLUME III METEOROLOGY, AIR QUALITY, AND NOISE

<u>Table Number</u>	<u>Table</u>	<u>Page</u>
3-15e	24-Month Summary of Two-Highest Concentrations - Station 024	132
3-20	Comparisons of Maximum Background Levels with Ambient Standards	159
B-18	Ten Highest One Hour SO ₂ Averages During Baseline	435
B-19	SO ₂ 1-Hour Maximum Concentrations	436

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Table 3-15

24-MONTH SUMMARY OF TWO-HIGHEST CONCENTRATIONS
(November 1974-October 1976)
($\mu\text{g}/\text{m}^3$)

c. Station 024

Parameter	Highest Annual *	Maximum 24 Hour Value	Time	Maximum 8 Hour Value	Time	Maximum 3 Hour Value	Time	Maximum 1 Hour Value	Time	Maximum 5 Minutes Value	Time
SO ₂	1.3	1) 28.9 2) 25.8	4/13/75 3/3/75	12:00 12:00		1) 77.9 2) 53.9	12/10/74 5/2/75	1) 128.5 2) 56.4	12/10/74 5/2/75	1) 2586.7 2) 218.8	8/23/76 10/11/75
H ₂ S	.4							1) 70.9 2) 62.6	6/22/75 4/14/75	1) 148.1 2) 143.9	6/22/75 6/23/75
Particulate	8.5	1) 178.0 2) 162.0	11/27/74 11/29/74								
TIC											
Cl ₄											
NH ₄ C											
O ₃											
NO _x											
NO											
CO											
NO ₂											

*Arithmetic

Table 3-20 COMPARISONS OF MAXIMUM BACKGROUND LEVELS WITH AMBIENT STANDARDS

Applicable Standard	Constituent	Averaging Time	Standard Limit ($\mu\text{g}/\text{m}^3$)	Max. Reading ($\mu\text{g}/\text{m}^3$)	Station with Max. Reading	Date of Max. Reading
Colorado Ambient Air Quality Standards	Particulates	Annual	45	11.2	023	'74-'75
National Ambient Air Quality Standards		24-hour	150	178(1)	024	11/27/74
Primary	SO ₂	Annual	80	1.3	021 & 024	'74-'75
Secondary	SO ₂	24-hour	365	43.1	021	6/16/75
Primary	NO ₂	3-hour	1300	87.7	023	12/21/74
Primary	Particulates	Annual	100	5.0	020	'75-'76
Secondary	Particulates	Annual	75*	10.7	023	'74-'75
Primary	Particulates	24-hour	260	178(1)	024	11/27/74
	NMHC	Annual	60*	10.7	023	'74-'75
	CO	24-hour	150	178(1)	024	11/27/74
	Oxidant	3-hour	160	2596.6 (2) (3)	023	6/27/76
		(6-9 a.m.)				
		8-hour	10,000	4501.9	020	6/ 3/75
		1-hour	40,000	4650.9	020	6/ 4/75
		1-hour	160	160.4	020	6/26/75

* Geometric Mean

(1) See also Table 3-21

(2) See also Table 3-23

(3) From 2/1/75 to 10/31/76

for additional high readings
for additional high readings

Table B-18
TEN HIGHEST ONE HOUR SO₂ AVERAGES DURING BASELINE

Site	1	2	3	4	5	6	7	8	9	10
020										
Concentration ($\mu\text{g}/\text{m}^3$)	189.1	111.6	109.8	82.3	33.9	32.8	31.3	31.0	31.0	31.0
Date/Time	9/18/76	9/18/76	9/17/76	9/17/76	7/14/75	3/7/75	3/8/75	3/7/75	3/7/75	3/8/75
Wind Speed (mph)	3:00	5:55	21:40	22:50	13:10	10:05	3:05	11:10	23:25	00:45
Wind Direction	3	6	7	7	1	10	5	10	5	1
	96	119	111	115	157	186	113	189	111	107
021										
Concentration ($\mu\text{g}/\text{m}^3$)	67.9	65.8	63.2	60.3	56.0	53.4	34.3	32.8	32.8	31.7
Date/Time	6/16/75	6/16/75	6/16/75	6/16/75	6/16/75	1/26/75	5/5/75	11/1/74	3/7/75	5/5/75
Wind Speed (mph)	13:45	15:15	16:20	17:25	18:30	14:05	10:50	1:35	10:05	11:55
Wind Direction	15	19	16	7	1	10	6	5	9	7
	304	309	320	320	339	177	148	133	192	158
022										
Concentration ($\mu\text{g}/\text{m}^3$)	27.4	27.1	26.5	26.3	26.0	20.8	18.2	18.0	17.8	17.8
Date/Time	6/12/75	6/12/75	6/11/75	6/11/75	6/11/75	12/20/74	5/23/75	5/24/75	5/24/75	2/1/76
Wind Speed (mph)	0:00	1:15	21:05	19:30	16:45	1:15	20:55	2:25	3:40	7:35
Wind Direction	7	9	0	3	6	6	3	2	1	10
	123	117	71	41	282	116	80	61	97	115
023										
Concentration ($\mu\text{g}/\text{m}^3$)	97.9	59.9	59.3	58.0	54.9	54.6	52.6	50.7	50.6	49.9
Date/Time	12/21/74	8/20/75	8/20/75	8/20/75	8/20/75	3/22/76	3/22/76	3/22/76	1/1/75	1/1/75
Wind Speed (mph)	1:55	4:15	5:20	6:25	7:30	14:20	15:25	16:30	14:30	11:35
Wind Direction	6	2	1	2	2	9	8	7	5	6
	158	171	186	178	94	144	146	141	17	340
024										
Concentration ($\mu\text{g}/\text{m}^3$)	128.5	56.4	54.3	54.1	51.7	50.8	50.8	49.5	49.1	41.7
Date/Time	12/10/74	5/2/75	1/5/75	5/2/75	12/10/74	3/3/75	3/4/75	5/2/75	4/13/75	10/8/75
Wind Speed (mph)	6:20	3:20	11:50	4:25	7:25	22:50	00:05	5:30	17:35	4:20
Wind Direction	0	1	11	2	0	4	4	2	5	10
	4	97	173	1	54	62	55	111	284	218

Table B-19
1- HOUR MAXIMUM CONCENTRATIONS
(1974-1975)

By Month

Trailer	Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
020	Value (ug/m ³)	4.6	17.4	2.6	7.6	32.8	7.2	7.6	20.8	33.9	12.4	9.1	20.8
	Date	11/1	12/8	1/14	2/20	3/7	4/12	5/30	6/23	7/14	8/4	9/27	10/2
	Time (MST)	13:50	21:48	16:10	10:55	10:05	11:35	14:50	4:45	13:10	13:20	11:30	8:30
	Wind Direction (Deg.)	204	102	134	275	190	266	292	134	157	299	318	182
	Wind Speed (MPH)	5	1	5	12	8	3	7	7	1	5	6	9
023	Value (ug/m ³)	0.2	97.9	50.6	5.0	12.2	8.2	7.2	3.7	13.2	59.9	9.3	7.6
	Date	11/1	12/21	1/1	2/20	3/29	4/5	5/4	6/23	7/28	8/20	9/1	10/1
	Time (MST)	11:15	1:55	14:30	11:30	22:05	10:05	11:00	12:45	19:15	4:15	8:45	23:05
	Wind Direction (Deg.)	191	156	358	236	201	184	186	199	184	171	211	228
	Wind Speed (MPH)	8	7	4	18	3	18	27	11	11	2	12	10
021	Value (ug/m ³)	32.8	25.8	53.4	23.2	21.3	21.7	34.3	67.9	18.2	16.9	11.3	20.8
	Date	11/1	12/19	1/26	2/21	3/25	4/25	5/5	6/16	7/11	8/17	9/2	10/1
	Time (MST)	1:35	15:45	14:05	5:00	9:00	20:25	10:50	13:45	22:55	12:35	19:00	23:05
	Wind Direction (Deg.)	123	324	176	156	154	288	147	304	127	219	116	125
	Wind Speed (MPH)	5	7	10	5	8	11	5	15	5	7	3	2
022	Value (ug/m ³)	13.0	20.8	5.9	11.7	14.1	2.6	18.2	27.4	14.5	16.3	2.4	13.0
	Date	11/6	12/20	1/25	2/22	3/3	4/17	5/23	6/12	7/23	8/17	9/17	10/1
	Time (MST)	17:00	1:15	14:25	8:45	8:30	3:30	20:55	0:00	0:40	14:10	4:55	6:1
	Wind Direction (Deg.)	120	127	275	107	110	291	82	123	114	275	88	121
	Wind Speed (MPH)	1	6	9	2	5	5	1	7	7	5	2	7
024	Value (ug/m ³)	5.2	128.5	54.3	34.3	50.8	49.1	56.4	33.0	10.6	26.5	20.6	41.7
	Date	11/29	12/10	1/5	2/26	3/3	4/13	5/2	6/23	7/17	8/2	9/7	10/8
	Time (MST)	21:10	6:20	11:50	2:25	22:50	17:35	3:20	9:20	19:55	11:05	4:25	4:20
	Wind Direction (Deg.)	80	12	178	63	60	284	103	212	170	317	114	218
	Wind Speed (MPH)	3	0	9	0	3	5	0	5	8	7	7	10

(1975-1976)

Trailer	Item	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
020	Value (ug/m ³)	11.9	.2	0.0*	3.5	1.1	3.5	12.4	11.1	7.6	.9	189.1	10.6
	Date	11/15	12/12		2/17	3/14	4/4	5/22	6/11	7/13	8/24	9/18	10/17
	Time (MST)	18:10	1:35		14:25	9:45	9:45	4:35	4:00	11:35	11:55	3:00	4:35
	Wind Direction (Deg.)	113	99		296	175	173	102	125	279	255	96	86
	Wind Speed (MPH)	4	3		10	8	8	(2)	(2)	(2)	6	3	7
023	Value (ug/m ³)	2.0	19.1	51.4 ⁽¹⁾	7.2 ⁽¹⁾	54.6	12.8	13.9	6.9	7.2	2.6	9.6	13.5
	Date	11/18	12/13	1/5	2/6	3/22	4/28	5/18	6/3	7/18	8/3	9/7	10/2
	Time (MST)	12:40	7:10	11:10	11:30	14:20	6:40	10:05	13:15	13:00	10:20	8:15	3:35
	Wind Direction (Deg.)	241	139	129	311	144	271	221	194	315	198	72	161
	Wind Speed (MPH)	12	5	14	3	9	1	13	22	14	15	2	3
021	Value (ug/m ³)	11.7	5.2	28.2	10.4	23.4 ⁽¹⁾	18.2	18.2	12.8	14.3	4.1	8.5	5.2
	Date	11/12	12/6	1/5	2/1	3/13	4/10	5/16	6/8	7/11	8/12	9/4	10/3
	Time (MST)	11:20	23:40	7:50	0:00	12:10	3:30	3:00	2:20	3:20	15:10	5:50	2:10
	Wind Direction (Deg.)	298	108	132	CALM	128	104	99	46	89	156	349	107
	Wind Speed (MPH)	4	5	6		7	1	4	1	2	7	0	8
022	Value (ug/m ³)	13.7	13.5	16.9	17.8	17.4	13.0	6.7	1.5	13.7	6.5	6.3	(2)
	Date	11/1	12/7	1/8	2/1	3/14	4/16	5/3	6/17	7/6	8/6	9/23	(2)
	Time (MST)	13:35	14:35	5:10	7:35	0:10	10:25	5:40	2:15	2:55	4:50	7:55	(2)
	Wind Direction (Deg.)	266	125	101	115	CALM	266	117	96	88	118	116	(2)
	Wind Speed (MPH)	6	2	5	10		6	8	2	1	7	5	(2)
024	Value (ug/m ³)	22.1	10.0	5.9	3.0	4.6	4.3	4.6	8.7	10.0	16.1	13.7	14.3
	Date	11/7	12/14	1/1	2/4	3/14	4/8	5/20	6/15	7/16	8/29	9/9	10/5
	Time (MST)	3:20	2:30	14:20	12:30	4:30	9:55	5:10	8:10	5:15	11:25	5:35	6:15
	Wind Direction (Deg.)	103	291	286	148	168	342	179	330	119	179	123	106
	Wind Speed (MPH)	4	9	6	19	7	3	4	2	4	7	1	0

(1) Side-by-side monitoring of H_2S in Trailer 023 and of SO_2 in Trailer 021 was initiated, as a data reliability check, for three months beginning 1 January, 1976. Therefore, no SO_2 data were taken at 023. The data from the second SO_2 analyzer at 021 are reported in the row for 023 for January, February, and March.

(2) Missing Data.

*All data below minimum detectable limit.

BIOLOGICAL BASELINE STUDIES

TRACT C-b

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TABLE OF CORRECTIONS* AND ADDITIONS

II C-1 Terrestrial Wildlife Studies Interim Monitoring Report Corrections

<u>Table</u>	<u>Description</u>	<u>Page</u>
II C-4	Production and Utilization of Bitterbrush in the Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.	II C-7
II C-5	Production and Utilization of Bitterbrush in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.	II C-8
II C-6	Production and Utilization of Mountain Mahogany in the Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.	II C-9
II C-7	Production and Utilization of Mountain Mahogany in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.	II C-10
II C-8	Production and Utilization of Bitterbrush in the Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots.	II C-11
II C-9	Production and Utilization of Bitterbrush in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots.	II C-12
II C-10	Production and Utilization of Mountain Mahogany in the Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots.	II C-13
II C-11	Production and Utilization of Mountain Mahogany in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots.	II C-14

* Corrected tables bear the same table and page numbers assigned to them in the October 14, 1977 Interim Monitoring Report.

TABLE OF CORRECTIONS* AND ADDITIONS

II C-2 Aquatic Studies Interim Monitoring Report Additions

<u>Table</u>	<u>Description</u>	<u>Page</u>
II C-1	Periphyton Biomass at Piceance Creek, October 20, 1977	II C-4 to C-6
II C-2	Benthic Study - October, 1976	II C-7
II C-3	Benthic Study - January, 1977	II C-8
II C-4	Benthic Study - February, 1977	II C-9
II C-5	Benthic Study - March, 1977	II C-10 & C-11
II C-6	Benthic Study - April, 1977	II C-12 & C-13
II C-7	Benthic Study - May, 1977	II C-14 & C-15
II C-8	Benthic Study - June-July, 1977	II C-16 & C-17
II C-9	Benthic Study - August, 1977	II C-18 & C-19
II C-10	Benthic Study - November, 1977	II C-20
II C-11	Fish Population Sampling, November, 1977 - P-3	II C-21 & C-22
II C-12	Fish Population Sampling, November, 1977 - S-1	II C-23
II C-13	Fish Population Sampling, November, 1977 - P5-A	II C-24
II C-14	Fish Population Sampling, November, 1977 - S-2	II C-25

* Corrected tables bear the same table and page numbers assigned to them in the October 14, 1977 Interim Monitoring Report.

II C Biology

II C-1 Terrestrial Wildlife Studies

Introduction

Shrub Production and Utilization

The following data updates the tables found in the October 14, 1977 Interim Monitoring Report, in which some of the tabulations were incomplete.

The tables retain the same table and page numbers as in the Interim Monitoring Report.

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INTERIM MONITORING REPORT CORRECTIONS

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Table C II-4

Production and Utilization of Bitterbrush in the Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.

Transect	A	B	C
	PRODUCTION: length of new shoots in fall (mm) Mean $\pm$ SE (N)	Length of shoots remaining in spring (mm) Mean $\pm$ SE (N)	UTILIZATION: in percent $C = \frac{A-B}{A} \times 100$
P/J-C-1	83 $\pm$ 7 (100)	33 $\pm$ 3 (100)	61
P/J-C-2	105 $\pm$ 6 (100)	36 $\pm$ 5 (100)	66
P/J-C-3	107 $\pm$ 9 (100)	42 $\pm$ 4 (100)	61
P/J-T-1	64 $\pm$ 5 (100)	26 $\pm$ 2 (100)	59
P/J-T-2	115 $\pm$ 15 (100)	29 $\pm$ 4 (100)	74
P/J-T-3	85 $\pm$ 7 (100)	26 $\pm$ 3 (100)	69

Table C II-5

Production and Utilization of Bitterbrush in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.

Transect	A	B	C
	PRODUCTION: length of new shoots in fall (mm)	Length of shoots remaining in spring (mm)	UTILIZATION: in percent
	Mean $\pm$ SE (N)	Mean $\pm$ SE (N)	$C = \frac{A-B}{A} \times 100$
Ch-C-1	126 $\pm$ 12 (100)	47 $\pm$ 5 (100)	62
Ch-C-2	196 $\pm$ 23 (100)	65 $\pm$ 8 (100)	67
Ch-C-3	113 $\pm$ 9 (100)	16 $\pm$ 2 (100)	86
Ch-T-1	185 $\pm$ 22 (100)	42 $\pm$ 4 (100)	77
Ch-T-2	308 $\pm$ 29 (100)	56 $\pm$ 5 (100)	82
Ch-T-3	274 $\pm$ 26 (100)	96 $\pm$ 12 (100)	65

Table C II-6

Production and Utilization of Mountain Mahogany in the Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.

Transect	A	B	C
	PRODUCTION: length of new shoots in fall (mm) Mean $\pm$ SE (N)	Length of shoots remaining in spring (mm) Mean $\pm$ SE (N)	UTILIZATION: in percent $C = \frac{A-B}{A} \times 100$
P/J-C-1	51 $\pm$ 3 (100)	26 $\pm$ 3 (100)	49
P/J-C-2	76 $\pm$ 6 (100)	33 $\pm$ 5 (90)	56
P/J-C-3	64 $\pm$ 6 (100)	21 $\pm$ 2 (100)	67
P/J-T-1	57 $\pm$ 4 (100)	14 $\pm$ 2 (100)	75
P/J-T-2	55 $\pm$ 4 (100)	28 $\pm$ 4 (100)	49
P/J-T-3	57 $\pm$ 3 (100)	22 $\pm$ 2 (100)	61

Table C II-7

Production and Utilization of Mountain Mahogany in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.

Transect	A	B	C
	PRODUCTION: length of new shoots in fall (mm)	Length of shoots remaining in spring (mm)	UTILIZATION: in percent
	Mean $\pm$ SE (N)	Mean $\pm$ SE (N)	$C = \frac{A-B}{A} \times 100$
Ch-C-1	65 $\pm$ 3 (100)	20 $\pm$ 2 (100)	68
Ch-C-2	78 $\pm$ 5 (100)	26 $\pm$ 3 (100)	67
Ch-C-3	109 $\pm$ 9 (100)	25 $\pm$ 3 (90)	77
Ch-T-1	111 $\pm$ 13 (100)	34 $\pm$ 7 (100)	69
Ch-T-2	91 $\pm$ 9 (100)	19 $\pm$ 2 (100)	79
Ch-T-3	114 $\pm$ 15 (100)	39 $\pm$ 5 (90)	66

Table II C-8

Production and Utilization of Bitterbrush in the Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots.

Transect	A	B	C
	PRODUCTION: weight of new shoots in fall (g) Mean $\pm$ SE (N)	Weight of shoots remaining in spring (g) Mean $\pm$ SE (N)	UTILIZATION: in percent $C = \frac{A-B}{A} \times 100$
P/J-C-1	.079 $\pm$.007 (100)	.055 $\pm$.006 (100)	30
P/J-C-2	.128 (100)*	.075 (100)**	41
P/J-C-3	.132 (100)*	.067 (100)**	49
P/J-T-1	.052 (100)*	.031 (100)**	40
P/J-T-2	.106 $\pm$.011 (100)	.045 $\pm$.009 (100)	57
P/J-T-3	.104 $\pm$.011 (100)	.047 $\pm$.006 (100)	54

* Estimates obtained from linear regression equation

** Estimates are means of all n shoots combined

Table II C-9

Production and Utilization of Bitterbrush in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots

Transect	A	B	C
	PRODUCTION: weight of new shoots in fall (g) Mean $\pm$ SE (N)	Weight of shoots remaining in spring (g) Mean $\pm$ SE (N)	UTILIZATION: in percent $C = \frac{A-B}{A} \times 100$
Ch-C-1	.168 (100)*	.086 (100)**	49
Ch-C-2	.300 (100)*	.175 (100)**	42
Ch-C-3	.162 $\pm$.014 (100)	.029 $\pm$.004 (100)	82
Ch-T-1	.276 (100)*	.073 (100)**	74
Ch-T-2	.383 $\pm$.039 (100)	.153 $\pm$.018 (100)	60
Ch-T-3	.373 $\pm$.040 (99)	.275 $\pm$.041 (100)	26

* Estimates obtained from linear regression equation

** Estimates are means of all n shoots combined

Table II C-10

Production and Utilization of Mountain Majogany in the Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots.

Transect	A	B	C
	PRODUCTION: weight of new shoots in fall (g) Mean $\pm$ SE (N)	Weight of shoots remaining in spring (g) Mean $\pm$ SE (N)	UTILIZATION: in percent $C = \frac{A-B}{A} \times 100$
P/J-C-1	.086 (100)*	.053 (90)**	38
P/J-C-2	.187 $\pm$.022 (100)	.039 $\pm$.016 (90)	55
P/J-C-3	.125 $\pm$.009 (100)	.052 $\pm$.008 (90)	59
P/J-T-1	.144 $\pm$.018 (100)	.034 $\pm$.005 (100)	76
P/J-T-2	.095 (100)*	.071 (100)**	25
P/J-T-3	.101 (100)*	.074 (100)**	27

* Estimates obtained from linear regression equation

** Estimates are means of all n shoots combined

Table C II-11

Production and Utilization of Bitterbrush in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.

Transect	A	B	C
	PRODUCTION: weight of new shoots in fall (g) Mean $\pm$ SE (N)	Weight of shoots remaining in spring (g) Mean $\pm$ SE (N)	UTILIZATION: in percent $C = \frac{A-B}{A} \times 100$
Ch-C-1	.106 $\pm$.010 (100)	.051 $\pm$.005 (100)	52
Ch-C-2	.156 (100)*	.080 (100)**	49
Ch-C-3	.236 (100)*	.094 (90)**	60
Ch-T-1	.240 (100)*	.068 (100)**	72
Ch-T-2	.285 $\pm$.028 (100)	.065 $\pm$.009 (100)	77
Ch-T-3	.272 $\pm$.038 (100)	.049 $\pm$.026 (90)	82

* Estimates obtained from linear regression equation

** Estimates are means of all n shoots combined

II C-2 Aquatic Studies

Introduction

The following are data that were not available for the October 14, 1977 Interim Monitoring Report. The scope of the studies and methods can be found in the above mentioned report. The benthos data furnished by the U.S.G.S. is a draft, with indentifications of some species tentative.

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INTERIM MONITORING REPORT ADDITIONS

Table II C-1

Abundance (unit/mm²) of periphyton from artificial substrates and biomass at Piceance Creek, Colorado on October 20, 1977.

	Station P-1					Station P-5					Station P-6				
	Rep. No.					Rep. No.					Rep. No.				
	1	2	3	Q	M	1	2	3	Q	M	1	2	3	Q	M
DIVISION BACILLARIOPHYTA (Diatoms)															
<u>Achnanthes lanceolata</u> var. <u>dubia</u>	P	29	-	-	9.7	58	22	58	-	46.0	49	29	15	-	31.0
<u>A. minutissima</u>	-	29	-	-	9.7	29	51	22	-	34.0	31	22	13	-	22.0
<u>A. sp.</u>	-	-	-	-	-	-	7	15	-	7.3	-	-	-	-	-
<u>Amphora ovalis</u>	P	-	15	-	5.0	P	P	P	-	-	P	-	P	-	-
<u>A. sp.</u>	-	-	-	-	-	15	7	-	-	7.3	-	-	-	-	-
<u>Caloneis amphisbaena</u>	P	P	P	-	-	P	P	-	-	-	P	-	P	-	-
<u>Cocconeis pediculus</u>	P	-	15	-	5.0	7	-	P	-	2.3	22	4	4	-	10.0
<u>C. placentula</u>	P	29	15	-	14.7	117	22	88	-	75.7	319	117	130	-	188.7
<u>Cyclotella meneghiniana</u>	P	15	-	-	5.0	-	-	P	-	-	P	P	-	-	-
<u>Cymatopleura elliptica</u>	-	P	-	-	-	P	P	P	-	-	-	-	P	-	-
<u>C. solea</u>	-	15	P	-	5.0	7	-	P	-	2.3	5	P	2	-	2.3
<u>Cymbella cymbiformis</u>	P	29	P	-	9.7	P	P	P	-	-	2	-	-	-	0.7
<u>C. minuta</u>	15	-	29	-	14.7	7	-	-	-	2.3	P	-	-	-	-
<u>Diatoma vulgare</u>	P	15	P	-	5.0	7	-	7	-	4.7	2	-	2	-	1.3
<u>D. vulgare</u> var. <u>linearis</u>	-	-	-	P	-	-	-	-	P	-	-	-	-	-	-
<u>Eunotia</u> sp.	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-
<u>Fragilaria crotonensis</u>	-	-	-	P	-	P	P	P	-	-	-	-	P	-	-
<u>F. leptostauron</u>	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-
<u>Gomphonema intricatum</u> var. <u>vibrio</u>	-	15	P	-	5.0	-	-	-	-	-	-	-	-	-	-
<u>G. olivaceum</u>	-	44	-	-	14.7	15	-	-	-	5.0	4	2	9	-	5.0
<u>G. parvulum</u>	88	44	29	-	53.7	P	15	P	-	5.0	31	26	27	-	28.0
<u>G. truncatum</u>	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-
<u>G. sp.</u>	-	15	-	-	5.0	-	-	-	-	-	-	-	7	-	2.3
<u>Gyrosigma acuminatum</u>	44	P	44	-	29.3	7	7	7	-	7.0	5	P	P	-	1.7
<u>Hantzschia amphioxys</u>	29	15	-	-	14.7	7	-	-	-	2.3	4	2	2	-	2.7
<u>Navicula cryptocephala</u>	-	-	P	-	-	44	-	-	-	14.7	-	-	-	-	-

Table II C-1 (continued)

	Station P-1				Station P-5				Station P-6			
	1	2	3	M	1	2	3	M	1	2	3	M
DIVISION BACILLARIOPHYTA (Diatoms) (Continued)												
<u>N. cuspidata</u>	-	-	-	-	P	-	P	-	-	-	-	-
<u>N. mutica</u>	-	-	-	-	7	-	P	2.3	2	-	-	0.7
<u>N. mutica</u> var. <u>undulata</u>	-	-	-	-	7	-	P	2.3	-	-	-	-
<u>N. pupula</u>	15	-	-	5.0	-	-	-	-	-	P	2	0.7
<u>N. secreta</u> var. <u>apiculata</u>	964	906	745	871.7	876	540	292	569.3	466	135	246	282.3
<u>N. viridula</u> var. <u>avenacea</u>	4192	4572	1796	3520.0	1431	913	730	1024.7	352	170	298	273.3
<u>N. spp.</u>	131	204	248	194.3	146	117	88	117.0	-	-	-	-
<u>Nitzschia acicularis</u>	P	-	15	5.0	-	7	-	2.3	159	89	80	109.3
<u>N. apiculata</u>	146	102	204	150.7	29	37	7	24.3	13	7	5	8.3
<u>N. dissipata</u>	-	29	29	19.3	-	22	7	9.7	2	-	-	0.7
<u>N. fonticola</u>	15	29	88	44.0	37	58	51	48.7	9	16	13	12.7
<u>N. hungarica</u>	-	15	15	10.0	-	-	-	-	-	P	-	-
<u>N. linearis</u>	234	219	204	219.0	117	44	29	63.3	120	18	18	52.0
<u>N. palea</u>	-	-	15	5.0	15	P	7	7.3	4	5	5	4.7
<u>N. nr. sigma</u>	-	29	15	14.7	P	P	P	-	-	-	P	-
<u>N. tryblionella</u> var. <u>victoriae</u>	-	-	P	-	-	-	-	-	-	-	-	-
<u>N. spp.</u>	628	234	263	375.0	372	175	131	226.0	139	119	172	143.3
<u>Pinnularia</u> sp.	-	-	-	-	-	-	-	-	-	-	-	-
<u>Pleurosigma delicatulum</u>	P	15	P	5.0	-	P	-	-	P	-	-	-
<u>Rhopalodia gibba</u> var. <u>ventricosa</u>	-	-	-	-	-	-	-	-	-	-	-	-
<u>R. musculus</u>	-	15	-	5.0	-	-	-	-	P	P	P	-
<u>Stephanodiscus</u> sp.	29	15	P	14.7	7	P	-	2.3	2	-	-	0.7
<u>Surirella angustata</u>	P	-	-	-	P	-	-	-	-	-	2	0.7
<u>S. ovalis</u>	15	15	15	15.0	7	7	P	4.7	4	P	P	1.3
<u>S. ovata</u>	365	219	175	253.0	95	37	22	51.3	11	9	26	15.3
<u>Synedra ulna</u>	29	15	P	14.7	7	15	P	7.3	P	4	P	1.3
Unidentified pennates	89	29	-	39.3	15	15	-	10.0	18	2	2	7.3

Table II C-1 (Continued)

	Station P-1					Station P-5					Station P-6				
	1	2	3	Q	M	1	2	3	Q	M	1	2	3	Q	M
DIVISION CHLOROPHYTA (Green algae)															
<u>Binuclearia</u> sp.	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-
<u>Closterium</u> sp.	P	-	-	-	-	-	P	-	-	-	2	-	-	-	0.7
<u>Stigeoclonium</u> sp.	-	-	-	-	-	-	P	-	-	-	5	5	5	5	5.0
Unidentified filament	-	15	-	-	5.0	-	-	-	-	-	-	-	-	-	-
DIVISION CYANOPHYTA (Blue-green algae)															
<u>Anabaena</u> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Aphanocapsa delicatissima</u>	-	-	-	-	-	-	-	36	-	12.0	-	-	-	-	-
<u>Oscillatoria pseudogeminata</u>	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-
<u>O.</u> sp.	-	-	-	-	-	P	-	-	-	-	-	-	2	-	0.7
DIVISION EUGLENOPHYTA (Euglenoids)															
<u>Phacus</u> sp.	-	-	-	-	-	-	-	-	-	-	2	-	-	-	0.7
Total	7025	6967	3973	5988.3	3498	2118	1599	2405.0	1784	860	1086	1243.3			
Ash free dry wt. (gm/cm ²)	.0012	.0013	.0023	.0016	.0009	.0006	.0011	.0009	.0003	.0003	.0002	.0003	.0003	.0003	.0003

P = present

Q = qualitative analysis

M = mean

Table II C-2

BENTHIC STUDY*
OCTOBER, 1976

Sample Stations**

Order	Family	Species	S-10	S-8	S-6	S-4	S-2	S-12
Ephemeroptera	Baetidae	Baetis sp.	3n	86n	5n		35n	
		Ephemerella mollitia		1n			2n	
		Ephemerella (serrata) sp. 1n		5n				
		Tricorythodes fallax	24n	10n	18n		3n	1n
		Isoperla-5-punctata	8L	2L	23L		13L	1L
		Hydropsyche sp.	2L	4L			2L	
		Limnephilid sp.					2L	
		Opiosericus sp.						
		Tipula sp.	6L	8L	2L			
		Hexatoma spinosa					3L	
		Simulium sp.		8L			9L	1L
		Pentaneura sp.		1L				
		Procladius sp.		3L	3L			2L
Plecoptera	Hydropsychidae	Cricotopus sp.	4L	4L	4L	3L		2L
		Hydrobaenus sp.						
		Hydrobaenus sp. (16 teeth)						
		Hydrobaenus sp. (sm)				3L		2L
		Calospectra sp.						
		Odontomesa sp.			1L			
		Limnophora sp.			1L		2L	
		Gammarus lacustris	3	8	2L		2	2
		Physa sp.	2	2				
		Lymnaea abrusa						
		Eiseniella tetraedra		3	1			1
		Helobdella stagnalis			2		3	
Amphipoda								
Mollusca								
Annelida								
Hirudinea								

* Data compiled by the U.S.G.S.

** Station Locations and Abbreviations

B-1, S-2, Piceance Creek below Rio Blanco, #09306007

B-3, S-4 Piceance Creek WRC, #09306222

B-5, S-6 Black Sulfer Creek, #09306175

B-7, S-8 Piceance Creek near Hunter Creek, #09306061

B-9, S-10 Piceance Creek below Ryan Creek, #09306200

B-11, S-12 Willow Creek, #09306058

a - Adult
B - Basket
L - Larvae
n - Nymph
p - Pupa
S - Surber

Table II C-3

PLANTIC STUDY*
JANUARY, 1977

Order	Family	Species	Sample Stations**				
			S-2	S-8	S-8	S-6	
Ephemeroptera	Baetidae	Baetis sp.	10ln	73n	2ln		
		Ephemerella (inuaria)	4n				
		Isoneria-5-punctata	1ln	2n			
Plecoptera	Perlodidae	Hydropsyche sp.	2L	4L			
		Limnephilid sp.		1L	4L		
Coleoptera	Elmidae	Optioserus sp.	1L				
		Holorusia grandis	3L		4L		
Diptera	Tipulidae	Tipula sp.			1L		
		Simulium sp.	3L	2L			
		Limnophora sp.	3L	1L	3L		
	Muscidae	Procladius sp.			2L		
		Dixaesa sp.	3L/3p		8L		
		Cardiocladius sp.	1L				
	Chironomidae	Cricotopus sp.	7L				
		Cricotopus sp. (3b)			18L		
		Hydrobaenus sp. (7c)	4L	2L	11L		
	Hydrobaeninae	Hydrobaenus sp. (6a)		1L			
		?					
		Calospectra sp.	2L	3L	2L		
Amphipoda	Amelidae	Cryptochironomus sp.			203L		
		Polypedilum sp.			30L		
		Gammarus lacustris	1	1	9L		
Mollusca	Naididae	Fiseniella sp.	1		7		
		Pristina sp.			3		
		Physa sp.		1			
Mollusca	Mollusca	Helobdella stagnalis	1	2			

* Data compiled by the U.S.G.S. **

Station Locations and Abbreviations:

B-1, S-2 Picancee Creek below Rio Blanco, #09306007
 B-3, S-4 Picancee Creek WRC, #09306222
 B-5, S-6 Black Sulfer Creek, #09306175
 B-7, S-8 Picancee Creek near Hunter Creek, #09306061
 B-9, S-10 Picancee Creek below Ryan Creek, #09306200
 B-11, S-12 Willow Creek, #09306058

a - Adult
 b - Basket
 L - Larvae
 n - Nymph
 p - Pupa
 S - Surber

Table II C-4
BENTHIC STUDY*
FEBRUARY, 1977

Order	Family	Species	Sample Stations**											
			B-3	S-4	B-5	S-6	B-7	S-8	B-1	S-2	B-9	B-10	S-12	
Ephemeroptera	Baetidae	Baetis sp.				27n				8n	1n	12n		
		Ephemerella(immaria) Tricorythodes fallax				3n	1n	13n	1n	5n	1n	1n		
Odonata	Gomphidae	Ophiogomphus severus								1n				
		Ophiogomphus borealis	1n								1n			
Plecoptera	Perlidae	Isoperla 5-Punctata			6n	4n	12n		17n	2n	72n	7n		
	Neururidae	Capnia sp.	3n											
Tricoptera	Hydropsychidae	Hydropsyche sp.	13L	6L			21L	1n	13L	4L	35L	6L		
	Limnephilidae	Limnephilid genus			1L		34L	1L	3L	16L	1L	1L		
Coleoptera	Brachycentridae	Brachycentrus americana												
	Halipidae	Brychius sp.					2a		4L					
Diptera	Limnidae	Optioseurus sp.												
	Tipulidae	Tipula sp.			17L	2L	21L	1L	4L	5L	10L	6L		
		Dicranota sp.										1L	2L	
		Hexatoma spinosa				38L				2L		1L	1L	
	Chironomidae	Diamesa sp.												
		Pentaneura sp.	1L											
		Procladius sp.		1L	3L	4L								
		Hydrobaenus sp.				82L								
		Hydrobaenus sp.			14L	187L								
		Cricotopus sp.				10L				1L	2L	2L		
		Cricotopus sp.												
		Calospectra sp.		2L	17L	74L				1L				
		Odontomesa sp.			2L	106L								
		Polypedium sp.				1L								
	Simuliidae	Simulium sp.					2L				2L	1L		
Amphipoda	Muscidae	Limnophora sp.	15L	39L										
		Gammarus locustris							6L					
Mollusca		Physa sp.			37	3	77	4	9	1	22		1	
		Eiseniella tetraedra					22		9				2	
Annelida		Tubifex tubifex			1		2		2					
		Helobdella stagnalis	1	2		19	60		3					

* Data compiled by the U.S.G.S.

** Station locations and Abbreviations

B-1, S-2 Piceance Creek below Rio Blanco, #09306007
 B-3, S-4 Piceance Creek WRC, #09306222
 B-5, S-6 Black Sulfer Creek, #09306175
 B-7, S-8 Piceance Creek near Hunter Creek, #09306061
 B-9, S-10 Piceance Creek below Ryan Creek, #09306200
 B-11, S-12 Willow Creek, #09306058

a - Adult
 B - Basket
 L - Larvae
 n - Nymph
 p - Pupa
 S - Suber

Table II C-5

BENTHIC STUDY*
MARCH, 1977

Order	Family	Species	Sample Stations**										
			B-3	S-4	B-5	S-6	B-7	S-8	B-1	S-2	B-9	S-10	S-12
Plecoptera	Baetidae	Baetis sp.	1n			10n		251n 6n		11n 16n	2n	26n 11n 2n	85n
	Gomphidae	Tricorythodes fallax											
	Perlidae	Ophiogomphus severus	8n			1n							
Tricoptera	Hydropsychidae	Isoperla 5-Punctata	1n		4n		6n	29n	2n	9n	50n	1n	70n
		Hydropsyche sp. (1)	36L		1L	1L	1L	5L		2L	3L	6L	25L
		Hydropsyche sp. (2)										1L	
Coleoptera	Limnephilidae	Limnephilid genus (1)					9L	4L			1L		
		Limnephilid genus (2)											
	Brachycentridae	Brachycentrus americana				1L						1L	
	Elmidae	Optioserus sp.				1L		7L		9L			5L
	Tipulidae	Tipula sp.			6L	1L	21L	4L 2L	3L	3L	10L	1L	3L 4L 2L 1L
		Dicranota sp.								2L			
		Hexatoma spinosa											
		Limnophila sp.				3L 18L		4L				7L	
		Dianesa sp.			1L								
		Procladius sp.	19L	2L	3L	5L		1L		2L		4L	
		Procladius sp.			1L	1L				1L			
		Hydrobaenus sp. (6c)		4L		1L		6L		5L		14L/4p	
		Hydrobaenus sp. (7c)				54L							
		Cricotopus sp.	3L	17L		10L/1p 7L/13p		13L				28L	
		Calospectra sp.				12L 2L							
		Odontomesa sp.			1L			1L		3L		1L	
		Tanytarsus sp.			41L							1L	
		Simulium sp.	3L	1L									
		Limnophora sp.	1L					1L	1L				
		Tabanus sp.											
Amphipoda	Ceratopogonidae	Palpomyia sp.								1L			
	Psychodidae	Pericoma sp.											
	Gammaridae	Gammarus lacustris			13	1L	17 7	3	1		3		1
	Physidae	Physa sp.											

BENTHIC STUDY*
MARCH, 1977

* Data compiled by the U.S.G.S.

Station Locations and Abbreviations

B-1, S-2 Picancee Creek below Rio Blanco, #09306007
B-3, S-4 Picancee Creek WRC, #09306222
B-5, S-6 Black Sutter Creek, #09306175
B-7, S-8 Picancee Creek near Hunter Creek, #09306061
B-9, S-10 Picancee Creek below Ryan Creek, #09306200
B-11, S-12 Willow Creek, #09306058

a - Adult
B - Basket
L - Larvae
n - Nymph
p - Pupa
S - Spider

Table II C-6
BENTHIC STUDY
APRIL, 1977

Order	Family	Species	Sample Stations**											
			B-1	S-2	B-3	S-4	B-5	S-6	B-7	S-8	B-9	S-10	B-11	S-12
Ephemeroptera	Baetidae	Baetis sp.	2n	22n				65n	5n	47n	1n	16n		10n
		Trichemerella (inauria)	9n	299n			1n	13n	10n	20n	10n	12n		7n
Atonata	Gomphidae	Tricorythodes fallax		2n				1n	1n	5n	1n	5n		
		Ophiogomphus severus						1n			2n			
		Isoperla 5-Punctata	33n	145n	1n	5n	8n	8n	145n	69n	88n	109n	3n	9n
		Hydropsyche sp.	1p/8L	10L	3L	2L		20L	4L	28L	10L	7L	3L	
		Limnephilidae	1L					48L/6p	3L	15L	2L	5L		
Coleoptera	Brachycentridae	Platycentropus sp.							2L					
		Brachycentrus americana							3L					
		Agabus sp.		1L										
		Glossosomatidae												
		Elmidae	1L	7a/14L	1a	1L		2L	4a/2L	15a/3L	1L	3a/1L		
Diptera	Tipulidae	Hydropidae												
		Hydrophilidae												
		Pytiscidae												
		Tipula sp.	13L	6L			4L		73L	3L	6L		2L	
		Dicranota sp.		5L					1L	4L	3L			
Chironomidae	Chironomidae	Ilexatoma spinosa						5L				1L		9L
		Limnophila sp.												11L
		Pentaneura sp.	1L	2L	1L	5L					1L	3L/2p		2L
		Procladius sp.		24L		5L	3L	3L						
		Hydrobaenus sp. (7c)		9L/2p		72L/2p	8L/4p	2344L/149p	2L	72L	220L/7p	273L		
		Cricotopus sp.				53L/5p		20L		17L	4L	12L		
		Damesa sp.						4L						
		Hydrobaenus sp. (5a)												
		Criospectra sp.					1L	3L						
		Tanutarsus sp.				2L	21L	14L				4L		4L
		Odontomesa sp.		1L				6L						
		Polypedilum sp.						14L						
		Simulium sp.				18L		1L						
		Muscidae												
		Ceratopogonidae										1L		
		Stratiomyidae		24L		10L		6L		19L				
								1L						

Table II C-6 (Cont.)

BENTHIC STUDY*
APRIL, 1977

Order	Family	Species	B-1	S-2	B-3	S-4	B-5	S-6	B-7	S-8	B-9	S-10	B-11	S-12
Amphipoda	Gammarus lacustris		4		1		3	2	43	1	3		4	
		Physa sp.	1						8		2			
		Tubifex tubifex				4	300	122						2
Mollusca	Linnodrilus sp.									10				
		Elseniella tetraedra	13	1										
		Helobdella stagnalis	6				2	1	68	6	4	2		
		Acari (water mites)		15		9				18		18		1

* Data compiled by the U.S.G.S.

** Station Locations and Abbreviations

B-1, S-2 Piceance Creek below Rio Blanco, #09306007
 B-3, S-4 Piceance Creek WRC, #09306222
 B-5, S-6 Black Sulfer Creek, #09306175
 B-7, S-8 Piceance Creek near Hunter Creek, #09306061
 B-9, S-10 Piceance Creek below Ryan Creek, #09306200
 B-11, S-12 Willow Creek, #09306058

a - Adult
 B - Basket
 L - Larvae
 n - Nymph
 p - Pupa
 S - Suber

Table II C-7

BENTHIC STUDY*
MAY, 1977

Order	Family	Species	Sample Stations**										
			B-1	S-2	B-3	S-4	B-5	S-6	B-7	S-8	B-9	S-10	S-12
Ephemeroptera	Baetidae	Baetis sp.		108n				141n	8n	132n			81n
		Tricorythodes fallax	4n	6n	3n	2n			9n	5n	6n	16n	
		Ephemerella (inuaria)		12n			1n	3n	9n	5n	3n		
Alonata Plecoptera Tricoptera	Gomphidae	Parameletus sp.			4n	1n	1n	3n	58n	37n	6n		
		Ophiogomphus severus		23n	1n		4n		61/1p	21/2p	11L/4p	10n	27n
		Isoperla-5-punctata			1L	2p			19L		3L	2L	2L
		Hydropsyche sp.					2L		3L		2L		1L
		Limnephilidae							5L				1L
		Brachycentrus americana	2L						4a	41a/17L		4L	
Coleoptera	Elmidae	Orthotrichia sp.		7L									1L
		Optioscerus sp.	1a					1L	3L	2L	2a	1a	
		Helichus sp.		2L		2L		2L			1L	1L	8L
		Agabus sp.					3L						
Diptera	Dytiscidae	Deronectes sp.					6L		33L	1L	26L	1L	8L
		Tipula sp.	11L										
		Dicranota sp.											
		Pentaneura sp.	1L		1L	4L	1L	1L/3p		1L	4L/1p	5L	
	Chironomidae	Procladius sp.						4L					
		Hydrobaenus sp. (7c)		47L		19L/4a	2L	990L/47p		11L		244L	60L/12p
		Eukiefferiella sp.		31L		101L		185L	3L	94L	24L	179L	454L
		Eukiefferiella sp. (16c)			20L							314L	9L/5p
		Damesa sp. (13b)				4L				2L	3L		8L
		Oloutomesa sp.		9L		4L		5p/106L				266L/17p	3L/1p
		Coryoncura sp.						5L					
		Calospectra sp.						4L					6L
		Cryptochironomus sp.						60L				9L	7L
		Tanytarsus sp.					29L	191L		1L			4L
		Simulium sp.						13L					
		Palpomyia sp.		37L	5L	218L/62p		2L		3L		2L	9L
		Stilobezzia sp.			1L	1p		1p		1p			
		Limnophora sp.						4L					
		Brachyleutra sp.						10L					
		Hemerodromia sp.						3L/1p					

Table II C-7 (Cont.)

BENTHIC STUDY*
MAY, 1977

Order	Family	Species	Sample Stations**											
			B-1	S-2	B-3	S-4	B-5	S-6	B-7	S-8	B-9	S-10	S-12	
Amphipoda		Cammarus lacustris		3			4	16	4	3	4			
		Hyalella azteca	1											
Mollusca		Physa sp.	1				1	7		8				
		Tubifex tubifex							50					
Hirudinea		Helobdella stagnalis	26	1			40		177	11	3			
				3		23			4	2		4		

* Data compiled by the U.S.G.S.

** Station Locations and Abbreviations

B-1, S-2 Picomance Creek below Rio Blanco, #09306007
 B-3, S-4 Picomance Creek WRC, #09306222
 B-5, S-6 Black Sulfer Creek, #09306175
 B-7, S-8 Picomance Creek near Hunter Creek, #09306061
 B-9, S-10 Picomance Creek below Ryan Creek, #09306200
 B-11, S-12 Willow Creek, #09306058

a - Adult
 B - Basket
 L - Larvae
 n - Nymph
 p - Pupa
 S - Surber

Table II C-8
BENTHIC STUDY*
JUNE-JULY, 1977

Order	Family	Species	Sample Stations**										
			B-1	S-2	B-3	S-4	B-5	S-6	B-7	S-8	B-9	S-10	S-12
Ephemeroptera	Baetidae	Cinygma sp.	4n										
		Baetis sp.	8n	115n			1n	131n	1n	182n	1n	18n	285n
		Tricorythodes fallax	2n	1n	1n	5n			1n	6n	4n	2n	
		Parameletus sp.											
Odonata	Gomphidae	Paraleptophlebia sp.											
		Orthogomphus severus	3n	2n	2n	1n	1n	3n			16n		43n
		Isoperla-5-punctata	10L	11L				5n	2L	1L	1L		2L
		Hydropsyche sp.		10L				1L		2L			2L
Plecoptera	Hydropsychidae												
		Hydropsychidae											
		Limnephilidae											
		Glossosom											
Tricoptera	Limnephilidae	Orthotrichia sp.		3L					7L		2L		
		Optioserus sp.	1a	45a/17L				8L	23L	16a/41L			1L
		Agabus sp.		1L		1L/1a	2L	6L	1L		1L		1L
		Beronestes sp.						1L					
Coleoptera	Pytiscidae	Halptius sp.	5a	3L				5L	24L	3L	1L		1L
		Flexatoma sp.	1L	1L									7L
		Pieranota sp.	1L	4L		20L	1L		2L	9L/1p	1L	5L	
		Pentaneura sp.	1L										
Diptera	Chironomidae	Psectadius sp.											
		(1) Cricotopus sp. (5b)		163L	2L	175L/18p		3L/1p	2L	23L		42L	60L/4p
		Lakiefferiella sp.		34L		1L		134L		21L		15L	41L
		Dianesa sp. (13b)						5L					
		(2) Odontomesa fulva		1L				1L	22L		27L	12L	
		Corynoneura sp.						2L				1L	
		Calospectra sp.		2L	1L	2L		3L				3L	4L
		Cryptochironomus sp.		3L		4L							3L
		Tanytarsus sp. (11a)		3L				5L	4L			10L	
		Polypedilum sp.		3L	1L		2L					8L	5L
		Chironomus sp. (17c)											
		Simulium sp.	2L	12L	39L/15p			20L	3L	5L	1L	15L	19L
	Ceratopogonidae	Palpomyia sp.										2L	
		Limnophora sp.		3L	1L			5L	4L				16L
		Homorodromia sp.		1L									
		Gemerus lacustris											
Amphipoda	Muscidae	Physa sp.	1				6		25				
		Tubifex tubifex					1						

Table II C-8 (Cont.)

BENTHIC STUDY*
JUNE-JULY, 1977

Order	Family	Species	Sample Stations**										
			B-1	S-2	B-3	S-4	B-5	S-6	B-7	S-8	B-9	S-10	S-12
Hirudinea		Helobdella stagnalis	8	10			22	2	6	12	1		
Acari				57				2	5	50		3	
Nostoc colonies (cyanophyta- blue green algae)						6							2

* Data compiled by the U.S.G.S.

** Station Locations and Abbreviations

B-1, S-2 Picence Creek below Rio Blanco, #09306007
 B-3, S-4 Picence Creek WRC, #09306222
 B-5, S-6 Black Sulfer Creek, #09306175
 B-7, S-8 Picence Creek near Hunter Creek, #09306061
 B-9, S-10 Picence Creek below Ryan Creek, #09306200
 B-11, S-12 Willow Creek, #09306058

a - Adult
 B - Basket
 L - Larvae
 n - Nymph
 p - Pupa
 S - Surber

(1) *Olontomesa* sp. *O. fulva* on all past results(2) *Cricotopus* sp. (5b) was *Hydrobaenus* sp. (7c)
on past results

Table II C-9

BENTHIC STUDY**
AUGUST, 1977

Order	Family	Species	Sample Stations**											
			B-1	S-2	B-3	S-4	B-5	S-6	B-7	S-8	B-9	S-10	S-12	
Ephemeroptera	Baetidae	Cinygma sp.												
		Baetis sp.	27n	37n		2n		51L	3n	259n	1n	9n	95n	
		Tricorythodes fallax	8n	8n		1n	2n	7L	4n	17n	39n	1n		
		Paraleptophlebia sp.		1n					1n					
Atonata	Gomphidae	Lophemerella (innaria) sp.	2n		26n									
		Ophiogomphus severus						1n			4n			
		Argia sp.			2n	5n								
		Isoperla-5-punctata						9n		5n	1n		22n	
Plecoptera	Hydropsychidae	Hydropsyche occidentalis	55L/1p	4L	15L	3L		3L	2L	2L	89L	14L		
			12L	6L							41L	2L		
		Hydropsyche sp.						1L	1L					
		Brachycentrus americana	1L				1p		2p	1p	4p		3L	
Coleoptera	Limnephilidae	Limnephilid genus												
		Optoserius sp.	10a/4L	4L					4L/1a	32L/25a	2L/1a	2L		
		Agabus sp.	1L											
		Helophilus sp.	4a											
Diptera	Tipulidae	Tipula sp.	1a											
		Hexatoma sp.												
		Pentaneura sp.		7L			2L	9L	2L	2L	1L			
			4L	1p/1L		3L	4L/1p	2L	1L	1p/1L	3L/1p	1p		
Diptera	Chironomidae	Procladius sp.												
		Odontomesa fulva												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												
		Procladius sp.												

Table II C-9 (Cont.)

BENTHIC STUDY*
AUGUST, 1977

Order	Family	Species	Sample Stations**										
			B-1	S-2	B-3	S-4	B-5	S-6	B-7	S-8	B-9	S-10	S-12
Diptera	Simuliidae	Simulium sp.	25L/20p	1L	41L	43L		32L	4L	23L	22L/2p		2L
	Ceratopogonidae	Palpomyia sp.				23L							
	Muscidae	Limnophora sp.					2L	1L					2L/2p
	Stratiomyidae	Hemerodromia sp.											
Amphipoda		Euparyphus sp.					12	15	22	3	1L		
Mollusca		Gammarus lacustris	4		4		2		10		6		
Annelida		Physa sp.		285									
Hirudinea		Tubificex tubifex						325					
Acari		Helobdella stagnalis	2	3			3L	3	14	3	2	3	
Hemiptera	Corixidae	Sigara sp.									2		

* Data Compiled by the U.S.G.S.

** Station Locations and Abbreviations

B-1, S-2 Piceance Creek below Rio Blanco, #09306007
 B-3, S-4 Piceance Creek WNC, #09306222
 B-5, S-6 Black Sulfer Creek, #09306175
 B-7, S-8 Piceance Creek near Hunter Creek, #09306061
 B-9, S-10 Piceance Creek below Ryan Creek, #09306200
 B-11, S-12 Willow Creek, #09306058

a - Adult
 B - Basket
 L - Larvae
 n - Nymph
 p - Pupa
 S - Surber

Table II C-10

BENTHIC STUDY*
NOVEMBER, 1977

Order	Family	Species	Sample Stations**									
			B-3	S-4	B-5	S-6	B-7	S-8	B-1	S-2	B-9	
Ephemeroptera	Baetidae	Baetis sp.			3n	11n	10n	293	8n	129n	2n	
		Ephemerella (inuaria)					12n			1n	3n	
		Parametopus sp.		1n								
		Siphonurid sp.					1n				1n	
Odonata	Gomphidae	Tricorythodes fallax						6n			2n	
		Ophiogomphus severus	2n								62n	
		Isoperla-5-punctata	2n		87n	15n	1n	24n		7n		
		Hydropsyche sp.	31L		30L	4L	8L	7L	4L	10L	46L	
Tricoptera	Hydropsychidae	Limnephilid sp.			4L		7L	8L	3L	1L	5L	
		Brachycentrus americana			26L							
		Optiosecurus sp.										
		Holorusia grandis			20L		16L	4L		1L	7L	
Coleoptera	Elmidae	Tipula sp.										
		Dicranota sp.										
		Dianesa sp.						1L		1L		
		Pentaneura sp.			9L	12L	2L	4p		1L		
Diptera	Chironomidae	Procladius sp.			1L	4L						
		Hydrogaenus sp. (7c)			1L	14L		13L		1L		
		Hydrogaenus sp. (8a)				2L						
		Cricotopus sp.			2L	5L	10L	22L		2L	13L	
		Cricotopus sp. (6c)	1L		4L/lp		11L					
		Calospectra sp.			5L	32L		3L				
		Oxentomus sp.			1L			1L				
		Simulium sp.			1L	2L	21L	23L	16L/2p	25L	1L	
Amphipoda	Mysididae	Limnephora sp.			4L	1L		1L			1L	
		Gammarus lacustris			27	2	27	10		1	4	
		Physa sp.	4		2		9	2	1		6	
		Lymnaea sp.			2		2					
Mollusca		Helobdella stagnalis										
Hirudinea												

* Data compiled by the U.S.G.S.

** Station locations and abbreviations

B-1, S-2 Piceance Creek below Rio Blanco, #09306007

B-3, S-4 Piceance Creek WRC, #09306222

B-5, S-6 Black Sulfer Creek, #09306175

B-7, S-8 Piceance Creek near Hunter Creek, #09306061

B-9, S-10 Piceance Creek below Ryan Creek, #09306200

B-11, S-12 Willow Creek, #09306058

a - Adult
B - Basket
L - Larvae
n - Nymph
p - Pupa
S - Surber

Table II C-11

FISH POPULATION SAMPLING OF PICEANCE CREEK, NOVEMBER 1977

STATION P-3

Mountain Suckers		Speckled-Dace	
Length (mm)	Weight (g)	Length (mm)	Weight (g)
155	46.0	109	12.0
170	56.0		
111	21.5		
112	16.5		
111	16.5		
129	24.5		
119	21.0		
99	10.5		
111	14.0		
105	10.5		
101	11.0		
105	12.0		
115	16.0		
119	15.0		
102	8.0		
99	8.0		
103	8.0		
70	3.0		
106	11.0		
70	2.5		
70	2.0		
159	44.5		
119	16.5		
124	20.0		
100	11.0		
161	43.0		

Table II C-11

FISH POPULATION SAMPLING OF PICEANCE CREEK, NOVEMBER 1977
STATION P-3 (Continued)

Mountain Suckers		Speckled-Dace	
Length (mm)	Weight (g)	Length (mm)	Weight (g)
95	10.5		
75	4.0		
66	3.0		
51	1.5		
Mean =	108.0		16.3
Std. Dev. =	28.5		13.9
Std. Error			
of the mean =	5.1		2.5
Total fish =	30		

Total number of fish collected at P-3 = 31

Table II C-12

FISH POPULATION SAMPLING OF STEWART CREEK, NOVEMBER 1977

STATION S-1

Mountain Suckers		Speckled-Dace		Brook Trout	
Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)
--	11.0	69	5.0	136	28.0
67	4.5	77	6.0	120	16.0
120	20.0	52	3.5	198	98.0
112	16.0	73	6.5	215	110.0
		79	8.5	163	46.0
		45	5.5	154	36.0
Mean = 100.0	12.9	46	4.0	129	26.0
Std. Dev. = 28.6	6.7	75	6.0	115	14.5
Std. Error		49	4.0	130	20.0
of the mean = 13.5	2.9	35	1.0	96	7.0

Total Fish = 4

Total Fish = 10

Total Fish = 10

Total number of fish collected at S-1 = 24

Table II C-13

FISH POPULATION SAMPLING OF PICEANCE CREEK, NOVEMBER 1977

STATION P5-A

No fish collected

Table II C-14

FISH POPULATION SAMPLING OF STEWART CREEK, NOVEMBER 1977

STATION S-2

No fish collected

III

OTHER STUDIES

Only two of the programs in the Other Studies categories were included in the Interim Monitoring Program. These are the Revegetation and Microenvironmental Studies. The other programs were completed during the Baseline period, including the Fish and Wildlife Management Plan, Scenic Studies, Aerial Photographic Studies, and Archaeological Studies.

Corrections to both of these studies are contained in this supplemental report. The entire revegetation section has been corrected, and completely replaces the revegetation report in the Interim Monitoring Report. The table and page numbers are the same as those which appeared in the Interim Monitoring Report.

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INTERIM MONITORING REPORT CORRECTIONS

III B Revegetation Program

Introduction

Evaluation of disturbed areas revegetated during the baseline period was begun in 1976. These studies are designed to measure the progress of the revegetated areas over time and to help evaluate trends occurring in the reestablishment of desirable vegetation cover as defined by the Environmental Lease Stipulations.

Scope of Study

At the onset of these studies all disturbed areas (mostly drill pads and their access roads) were documented using photographic techniques; seed bed treatments, seed mixtures, and methods were also recorded. In 1976 each pad was evaluated using a combined ocular and clipping method combined with phytosociological sampling techniques. During the Interim Period Monitoring sampling has been refined to include eight drill pad sites that are representative of major vegetation types within the study area. The categories sampled include, disturbed areas within upland sagebrush, bottomland sagebrush, chained pinyon-juniper rangeland, pinyon-juniper woodland, and agricultural meadowland.

Methods

Two major parameters were sampled on each disturbed site: 1) species frequency and cover, and 2) herbaceous standing crop.

Species frequency and cover was sampled using 10 one-centare quadrats permanently located in each disturbed site. Frequencies were noted by presence; percent cover of each species, litter, soil, rock, mosses, and lichens were estimated.

Herbaceous standing crop was measured at peak season (in August). Five, one-centare quadrats were randomly located in each disturbed site using a random number generator and clipped. Four fractions were clipped to ground level and weighed. The four fractions separated were, annual grasses, annual forbs, perennial grasses, and perennial forbs. In addition to the five clip quadrats, 50 one-centare quadrats, including the clip quadrats, were estimated ocularly.

Results and Discussion

The results of the combined phytosociological and standing crop measurements are presented below. These data have not been subjected to analysis at this time.

REVEGETATION PLOT DATA
JUNE 1977

[illegible]

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER			$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
		1m ²							
Agropyron cristatum		1m ²	4.0		0.4	3	30	4.0	5.9
Agropyron desertorum		"	3.0		0.3	2	20	3.0	3.9
Agropyron smithii		"	46.0		4.6	10	100	45.5	19.6
Bromus tectorum		"	2.0		0.2	1	10	2.0	2.0
Bouteloua gracilis		"	0.5		0.1	1	10	0.5	2.0
Chenopodium album		"	1.5		0.2	2	30	1.5	5.9
Crepis acuminatus		"	1.0		0.1	1	10	1.0	2.0
Kochia sp.		"	14.5		1.5	9	90	14.4	17.6
Melilotus sp.		"	1.5		0.2	2	20	1.5	3.9
Oryzopsis hymenoida		"	1.5		0.2	2	20	1.5	3.9
Penstemon sp.		"	0.5		0.1	1	10	0.5	2.0
Poa sp.		"	0.5		0.1	1	10	0.5	2.0
Salsola sp.		"	20.0		2.0	10	100	19.8	19.6
Sphaeralcea coccinea		"	2.0		0.2	1	10	2.0	2.0
Stipa comata		"	0.5		0.1	1	10	0.5	2.0
Tragopogon dubius		"	0.5		0.1	1	10	0.5	2.0
Unknown Perennial Forb		"	1.5		0.2	2	20	1.5	3.9

STAND # SC-15

REVEGETATION PLOT DATA

JUNE 1977

[illegible]

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron desertorum	1m ²	2.5	0.3	2	20	1.3	3.7
Agropyron intermedium	"	16.0	1.6	3	30	8.6	5.6
Agropyron smithii	"	45.5	4.6	10	100	24.4	18.5
Agropyron trachycaulum	"	2.5	0.3	2	20	1.3	3.7
Astragalus kentrophyta	"	0.5	0.1	1	10	0.3	1.9
Bromus tectorum	"	7.0	0.7	5	50	3.8	9.3
Carex sp.	"	0.5	0.1	1	10	0.3	1.9
Chrysothamnus viscidiflorus	"	1.0	0.1	1	10	0.5	1.9
Comandra umbellata	"	0.5	0.1	1	10	0.3	1.9
Crepis acuminatus	"	1.0	0.1	2	20	0.5	3.7
Festuca brachyphylla	"	0.5	0.1	1	10	0.3	1.9
Kochia sp.	"	2.0	0.2	3	30	1.1	5.6
Koeleria gracilis	"	4.5	0.5	3	30	2.4	5.6
Lupinus argenteus	"	2.0	0.2	1	10	1.1	1.9
Oryzopsis hymenoida	"	0.5	0.1	1	10	0.3	1.9
Perennial Grass	"	0.5	0.1	1	10	0.3	1.9
Phlox longifolia	"	1.0	0.1	2	20	0.5	3.7
Poa sp.	"	1.0	0.1	2	20	0.5	3.7
Salsola kali	"	96.0	9.6	10	100	51.5	18.5

2 of 2

III B-6
III B-4

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron desertorum	1m ²	21.5	2.2	3	30	12.1	7.1
Agropyron intermedium	"	16.5	1.7	5	50	9.3	11.9
Agropyron smithii	"	96.5	9.7	9	90	54.2	21.4
Agropyron trachycaulum	"	2.0	0.2	1	10	1.1	2.4
Agropyron trichophorum	"	19.0	1.9	6	60	10.7	14.3
Antennaria rosca	"	1.0	0.1	1	10	0.6	2.4
Cryptantha sp.	"	0.5	0.1	1	10	0.3	2.4
Descurainia pinnata	"	0.5	0.1	1	10	0.3	2.4
Kochia sp.	"	5.0	0.5	1	10	2.8	2.4
Koeleria gracilis	"	2.0	0.2	3	30	1.1	7.1
Lappula redowskii	"	0.5	0.1	1	10	0.3	2.4
Lepidium sp.	"	4.0	0.4	3	30	2.2	7.1
Oryzopsis hymenoida	"	1.5	0.2	2	20	0.8	4.8
Perennial Grass	"	4.0	0.4	2	20	2.2	4.8
Salsola sp.	"	2.0	0.2	1	10	1.1	2.4
Stipa comata	"	1.0	0.1	1	10	0.6	2.4
Symphoricarpos sp.	"	0.5	0.1	1	10	0.3	2.4

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron desertorum	1m ²	1.5	0.2	2	20	1.0	5.0
Agropyron smithii	"	32.5	3.3	10	100	21.5	25.0
Agropyron trachycaulum	"	3.5	0.4	3	30	2.3	7.5
Artemisia tridentata	"	0.5	0.1	1	10	0.3	2.5
Cercocarpus montanus	"	0.5	0.1	1	10	0.3	2.5
Chenopodium album	"	0.5	0.1	1	10	0.3	2.5
Crepis acuminatus	"	2.0	0.2	2	20	1.3	5.0
Kochia sp.	"	102.0	10.2	9	90	67.6	22.5
Lupinus argenteus	"	0.5	0.1	1	10	0.3	2.5
Oryzopsis hymenoida	"	1.0	0.1	2	20	0.7	5.0
Purshia tridentata	"	0.5	0.1	1	10	0.3	2.5
Sitanion longifolium	"	0.5	0.1	1	10	0.3	2.5
Trifolium gymnocarpon	"	1.5	0.2	3	30	1.0	7.5
Unknown Perennial Forb	"	0.5	0.1	1	10	0.3	2.5
Unknown Perennial Grass	"	3.5	0.4	2	20	2.3	5.0

Table III B-6
REVEGETATION PLOT DATA
JULY 1977

III B-9

REVEGETATION PLOT DATA
JUNE 1977III B-10

III B-11

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron desertorum	1m ²	2.0	0.2	1	10	1.3	2.2
Agropyron intermedium	"	34.5	3.5	7	70	21.8	15.2
Agropyron smithii	"	52.0	5.2	10	100	32.9	21.7
Agropyron trichophorum	"	7.0	0.7	2	20	4.4	4.4
Artemisia tridentata	"	4.0	0.4	1	10	2.5	2.2
Astragalus sp.	"	2.5	0.3	4	40	1.6	8.7
Bromus sp.	"	1.0	0.1	1	10	0.6	2.2
Bromus tectorum	"	3.0	0.3	1	10	1.9	2.2
Chrysothamnus viscidiflorus	"	1.0	0.1	1	10	0.6	2.2
Comandra sp.	"	1.0	0.1	2	20	0.6	4.4
Crepis acuminatus	"	0.5	0.1	1	10	0.3	2.2
Koeleria cristata	"	9.0	0.9	3	30	5.7	6.5
Lithospermum sp.	"	0.5	0.1	1	10	0.3	2.2
Oryzopsis hymenoida	"	1.5	0.2	2	20	1.0	4.4
Perennial Grass	"	30.5	3.1	3	30	19.3	6.5
Phlox longifolia	"	0.5	0.1	1	10	0.3	2.2
Poa sp.	"	6.0	0.6	2	20	3.8	4.4
Purshia tridentata	"	0.5	0.1	1	10	0.3	2.2
Senecio sp.	"	0.5	0.1	1	10	0.3	2.2
Stipa comata	"	0.5	0.1	1	10	0.3	2.2

Plot	DECEMBER 1976		JANUARY 1977		FEBRUARY 1977		MARCH 1977		APRIL 1977		MAY 1977		JUNE 1977		AUGUST 1977	
	Precip. cm.	Temperature °C Min. Max.	Precip. cm.	Temperature °C Min. Max.	Precip. cm.	Temperature °C Min. Max.	Precip. cm.	Temperature °C Min. Max.	Precip. cm.	Temperature °C Min. Max.	Precip. cm.	Temperature °C Min. Max.	Precip. cm.	Temperature °C Min. Max.	Precip. cm.	Temperature °C Min. Max.
1-M1	0.00	-27 17	0.30	-29 11	1.47	-19 19	2.41	-17 19	5.12	-17 29	1.86	-8 32	0.25	0 40	2.62	3 37
2-M2	0.20	-30 17	1.52	-32 20	1.98	-22 18	1.17	-20 17	4.60	-18 30	2.03	-9 33	0.51	-2 41	1.54	1 40
3-M3	0.23	-30 6	1.47	-32 10	2.26	-22 8	1.63	-20 13	4.35	-17 20	1.27	-8 30	0.08	-1 38	9.75	2 36
4-M4	0.51	-32 19	0.73	-21 13	2.01	-25 21	1.42	-20 21	4.65	-18 32	1.65	-10 36	0.38	-2 41	2.46	1 40
5-M5	0.25	-25 14	0.61	-27 11	()	-20 10	1.14	-16 15	2.85	-18 29	0.71	-9 31	0.15	-2 ()	4.06	() ()
6-M6	0.64	-15 11	0.75	-6 12	1.98	-20 15	1.65	-11 16	4.29	-16 28	1.73	-5 32	0.18	0 42	3.18	5 36
7-M7	0.00	-29 24	1.47	-17 14	1.73	-22 21	1.07	-19 20	4.24	-17 28	2.01	-7 30	0.20	0 39	5.79	4 38
20-M8	()	()	0.81	-28 24	()	-20 29	0.02	-16 22	0.38	-15 32	1.35	-8 37	()	()	4.57	6 44
0-M9	0.25	-26 22	2.08	-32 20	1.78	-19 24	1.25	-19 20	3.49	-15 31	1.22	-8 38	0.48	-1 43	4.65	3 39
0-M10	0.51	-31 20	1.33	-34 15	2.34	-25 21	1.65	-20 26	4.50	-16 31	2.09	-10 35	0.23	-2 44	5.61	2 32
0-M11	0.20	-26 9	1.83	-29 13	2.31	-22 20	1.37	-18 17	4.40	-17 28	1.78	-7 30	0.18	4 38	2.74	5 35
19-M12	0.38	-32 20	1.78	-30 15	2.01	-23 22	1.55	-21 21	4.79	-16 31	1.73	-10 34	0.15	0 41	2.72	1 37
0-M13	0.76	-22 4	1.24	-28 11	()	-22 16	0.00	-17 20	2.24	-17 27	1.96	-15 30	0.20	0 38	3.43	3 33
0-M14	0.33	-26 14	1.17	-28 14	1.30	-20 18	0.91	-17 20	2.87	-16 25	1.68	-6 31	0.13	1 40	3.30	4 35
0-M15	0.38	-28 40	1.22	-30 12	1.60	-26 18	1.35	-18 20	3.79	-15 29	1.50	-7 33	0.43	0 42	4.06	5 33
15-M16	0.81	-33 16	1.87	-33 11	0.76	-22 17	()	-23 15	2.82	-20 24	1.58	-8 30	0.38	-2 39	1.78	2 34
22-M17	0.33	-31 23	1.40	-31 11	1.85	-29 17	0.91	-21 15	4.16	-17 27	1.86	-9 31	0.20	-1 39	2.29	1 31

() = Missing data

* = July data is missing

MICROENVIRONMENTAL DATA, Table III C-6
TOTAL PRECIPITATION (mm)

		1976		1977							
		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG
ME6	- PINYON-JUNIPER WOODLAND	5.0	(6.4)	29.9	0.0	6.9	22.9	19.3	1.8	63.0	(31.8)
ME7	- CHAINED PINYON-JUNIPER RANGELAND	1.5	0.0	0.0	0.0	0.3	38.1	24.1	(2.0)	*	(57.9)
ME4	- BOTTOMLAND SAGEBRUSH	0.0	0.0	8.9	6.9	15.8	32.3	24.3	(3.8)	*	(24.6)
ME3	- UPLAND SAGEBRUSH	1.0	0.5	11.7	7.4	8.9	37.1	7.6	(0.8)	127.8	(97.5)

*missing data

() collected at corresponding spot check stations

III C Microenvironmental Programs

Introduction

The following microenvironmental data include:

1. The soil moisture data for September, which was not available for the Interim Monitoring Report.
2. Corrections to Table III C-6 of the Interim Monitoring Report.

Methods

Methods for the soil moisture studies are outlined in the October 14, 1977 Interim Monitoring Report.

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INTERIM MONITORING REPORT ADDITIONS

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Table III C-1
PLANT-SOIL WATER POTENTIAL DATA

September, 1977

VEGETATION TYPE	STATION	DATE	PROBE NUMBER	SOIL-WATER POTENTIAL BARS
Chained Pinyon-Juniper Rangeland	1-1M	9/22	1	(1)
		9/22	18	4.4 (2)
	2-2M	9/23	2	*
		9/23	19	*
	7-7M	9/23	7	1.1 (3)
		9/23	24	1.2 (3)
Pinyon-Juniper Woodland	5-5M	9/22	5	14.4 (2)
		9/22	22	2.8 (3)
	6-6M	9/22	6	19.0
		9/22	23	*
	0-14M	9/23	14	20.0 (2)
		9/23	31	20.5 (2)
	0-15M	9/23	15	5.7
		9/23	32	*
Bottomland Sagebrush Community	4-4M	9/23	4	21.4 (2)
		9/23	21	21.4
	0-9M	9/22	9	11.0
		9/22	26	12.3
	0-12M	9/23	12	0.6 (2)
		9/23	29	5.2 (2)
Upland Sagebrush Community	3-3M	9/22	3	5.3
		9/22	20	13.0
	0-16M		16	7.5 (2)
			33	10.8 (2)
Bunchgrass Community	20-8M	9/22-23	8	(2)
		9/22-23	25	(2)
	0-11M	9/22	11	*
		9/22	28	*
Rabbitbrush Community	0-10M	9/23	10	*
		9/23	27	*
Mixed Mountain Shrubland	0-13M	9/22	13	9.8
		9/22	30	7.1
Annual Weed Community	0-17M	9/23	17	1.1 (2)
		9/23	34	(4)

- * No reading due to dirty probes
 (1) faulty probe
 (2) Improbable reading due to a difference $> 3\mu\text{v}$ between
 read and input short
 (3) Questionable
 (4) Broken probe

STATION	DATE	WATER NUMBER	SOIL WATER POTENTIAL
1-1M	9/28	1	(1)
1-1M	9/28	18	(2)
1-2M	9/28	2	*
1-2M	9/28	19	*
1-3M	9/28	7	(3)
1-3M	9/28	24	(2)
2-2M	9/28	8	(3)
2-2M	9/28	25	(2)
2-2M	9/28	4	10.0
2-2M	9/28	43	*
2-2M	9/28	14	10.0 (3)
2-2M	9/28	26	20.2 (5)
2-2M	9/28	15	2.7
2-2M	9/28	35	*
2-2M	9/28	9	21.4 (2)
2-2M	9/28	10	21.4
2-2M	9/28	11	17.0
2-2M	9/28	12	12.4
2-2M	9/28	13	0.6 (2)
2-2M	9/28	20	2.2 (2)
2-2M	9/28	7	2.7
2-2M	9/28	28	12.8
2-2M	9/28	16	7.5 (2)
2-2M	9/28	42	10.0 (5)
2-2M	9/28-29	8	(2)
2-2M	9/28-29	18	(2)
2-2M	9/28	11	*
2-2M	9/28	28	*
2-2M	9/28	10	*
2-2M	9/28	29	*
2-2M	9/28	13	0.8
2-2M	9/28	20	7.1
2-2M	9/28	17	1.1 (2)
2-2M	9/28	24	(4)

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(1) No reading due to dirty probe
(2) Empty probe
(3) Inadequate reading due to a distance > 2m between
lead and inner shield
(4) Questionable
(5) Broken probe

INTERIM MONITORING REPORT CORRECTIONS

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